The Orchadian

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Official Journal of the Australasian Native Orchid Society Inc.

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Sarcochilus Evening Star 'Red and Yellow' Photo David Butler

The Orchadian

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Dedicated to the study and conservation of Australasian native orchids

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CONTENTS

Editorial	Peter B. Adams	244
President's Report	Sheryl D. Lawson	245
ANOS Awards #307 to 321		280
ANOS Groups Directory		287

Articles

Reflections on *Aeridinae* (*Sarcanthinae*) Hybridising and Discovering Good Parents	David Butler	246
Flasking Australian Orchid Species for Conservation	Roslyn Capell	252
Breeding and Culture of *Dendrobium kingianum* Style Hybrids	Peter B. Adams	258
Four New Papuan Species of *Dendrobium* section *Grastidium*	Paul Ormerod	267
Dendrobium section *Grastidium* (Blume) J.J. Smith	Peter B. Adams	276
Herbarium Studies of New Orchid Species – Some Recollections	Paul Ormerod	277
Ray Robinson 17.8.1937 – 15.11.2016	Bill Lavarack	279

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Please include your contact information for communication and publication.

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9th AUSTRALASIAN NATIVE ORCHID CONFERENCE AND SHOW
'GET GOING, GET GROWING'
21 – 26TH AUGUST 2019
STRATHPINE, QUEENSLAND

Early Bird Registration closes 31st January 2019.

ANOS Inc. in association with ANOS KABI Group Inc. invite all orchid growers to their 9th Triennial Show and Conference in Strathpine, Brisbane in 2019. The organisers are planning a program of speakers and workshops to provide an interactive learning experience covering many aspects of Australasian orchids. Come along and join in the fun, expand your knowledge, catch up with old friends and make new ones.

The orchid show will have floor and bench displays, with Champion Hybrid and Champion Species both receiving $500. There will also be a photographic competition.

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Publication in *The Orchadian* is for the benefit of two groups of people - the current readers and future ones who want to go back and learn of the interests, activities and ideas of their predecessors. It is important to record the history of ANOS activity, and the easiest eras to record are the current and recent past. Beyond a certain time point in the past, it is almost impossible to find reliable firsthand accounts. Although there is some interest in writing about past key ANOS figures and events, this is a very difficult and time consuming task. The balance of articles can be restricted by a low contribution rate from ANOS groups and growers about their culture, collections, shows and other activities. Content is largely governed by what is received on the editorial desk, and show reports and results of flowering are invited and most welcome.

For many growers on the east coast the spring-early summer season was disappointing, with reduced floral displays and poor opening of flowers, especially with *Dendrobium speciosum* and some hybrids. In my collection, the number of racemes and flowers per raceme of *Sarcochilus* were also reduced compared to last year, and this was evident as early as May. What are the thoughts of members about possible causes of seasonal variations-climatic, cultural or other?

There are few records of breeding results over decades. In this issue there are notable contributions about the process, results and patience required to conduct a breeding program of hybrids over several generations. David Butler reflects on his experience with *Aeridinae* (*Sarcanthinae*) breeding, and he identifies key plants that brought him success. It is clearly best when a breeder talks firsthand about the work. I have reviewed the activity and some results of breeding *Dendrobium kingianum* style hybrids. There is a major problem of few published accounts and very few photographs, in fact none readily available for some recently registered crosses. Even if there are a few photographs, they may not indicate the range of quality and flower colour. Many hybrids have not been exhibited to a significant extent and are still only found in the nursery of origin.

Paul Ormerod has spent time over many years in the depths of some of the world herbaria, identifying and describing new species, often collected only once many years ago. Some are small flowered with blooms that last only a day, as in *Dendrobium* section *Grastidium*, centred on New Guinea. In appreciating the orchid family it is important to consider all of them, not only the showiest that appear on the award pages. There are no photographs of the four new species described, as none are available, so a brief note on *Grastidium* and some photos of Australian species follows his article. Paul has also written a brief account on the work in herbaria and the methods which are used to bring long dried flowers back to a reconstituted state which displays their original features. New taxa are published in *The Orchadian* after peer review by two anonymous specialist reviewers working at herbaria or equivalent institutions. There must be sufficient evidence stated to justify the rank of the taxa described. Perhaps publication of these species will lead to rediscovery.

Ros Capell has considered the past and current need to produce species in flask for growing in collections, against a background of new legislation for protection of plants in the wild, and a range of high potential penalties for people who ignore the rules and regulations. This year I have seen wholesale destruction of prime orchid habitat north of Port Macquarie, and in Tasmania, where mature and re-growth forest is being cleared to make way for plantation timber, in the habitat of the only epiphyte in the state, *Sarcochilus australis*.

Peter Adams

President's Report

It has not been an easy year for orchid growers - there have been extreme weather events in many states, and the flowering generally has been reduced. Terrestrial flowering in the bush in eastern states has been sparse due to dryness. As growers we must be flexible and adapt to changing environmental conditions if we want to achieve optimum results. For many this means having greater control of growing conditions, with enclosed houses and automatic watering and misting systems.

I encourage growers who have won major prizes or awards this year, through any orchid organisation, to submit your plants for the Ira Butler awards (irabutlertrophy.org), at a cost of $15. It is one of the ways ANOS Inc. promotes awareness and appreciation of Australasian species and hybrids.

There is a growing interest in terrestrial orchid conservation by younger people in particular, who are joining in conservation and monitoring activities as citizen scientists. This is a movement which ANOS Inc. endorses as one of the ways to engage younger people in awareness and appreciation of wild habitats, not just orchids. We welcome information from these groups, and are keen to promote them through our website and newsletter. Below is a selection of terrestrial orchids flowering at the Arthur River, Tasmania, this spring and summer.

I hope you have enjoyed the newsletters, which are sent out every few weeks to keep members informed of activities. Please contact us through the ANOS Inc. website if you have events you would like to promote, or relevant information to pass on, and if you are not receiving the newsletter, you are able to register on the website.

We have had positive feedback about the new ANOS Hybrid Registration List, which is a searchable list, and freely available on the website. There have been enquiries about whether photographs could be placed online to go with the RHS registration details. Our webmasters would like to develop an on-line system where registrants of hybrids supply photographs of plants when they have registered them, so they are available for others to refer to. There are many hybrids registered that are rarely seen again, so this would provide a reference for writers and interested growers and breeders. Could hybridists please send us a photo of their registrations, both from the past and ongoing, if they would like to participate in this project.

Finally please remember that 2019 is our triennial Show and Conference, in Strathpine, Brisbane, and jointly hosted with KABI Group. Put it in your diary, let us know early you are coming, and participate in what we are planning to be an interactive and friendly learning experience.

Sheryl Lawson

Glossodia major

Thelymitra rubra

Pterostylis cucullata

Photos P. Adams

Reflections on *Aeridinae* (*Sarcanthinae*) Hybridising and Discovering Good Parents

Text and photos David Butler
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Foreword

Twenty-five years ago, having obtained a clean air cabinet and set up a small laboratory, I began on the rewarding journey of hybridising native orchids, with a special affection for line-breeding and hybridising *Aeridinae*. There is something extremely satisfying in pollinating your orchids, sowing the seed, watching it turn green, and after some years seeing the seedlings flower, knowing you were there every step of the way. I was asked to reflect on my hybridising and choice of parent material and became somewhat immersed in the journey.

Reflections

Today we see *Aeridinae* flowers in a bewildering range of colours and patterns, but it was not always so. As little as fifteen years ago a good red flower would earn the comment "that's an AD for sure" and be highly prized, while a year or two later arrived the good yellow colours to similar acclaim. Now, as is the way with things, the initial euphoria shown for the reds and yellows has subsided, the expectation being that hybridists can keep coming up with surprises, and that each new development will be merely a harbinger of greater things to come.

Chance, no doubt, plays a part in the breeding of new colours and patterns, but usually hybridists must trust their judgement and with each pollination cross their fingers, and be content to wait for a first flowering some years away. Seedlings may flower quickly, but these are the exception, and most will take at least four years from the time of pollination to first-flowering.

To shorten the odds in what is rather a game of chance, the hybridist may choose to use a recognised parent as either the pod-parent or pollen parent. Such a parent will usually have recognised dominant characteristics, and thereby a successful track-record in breeding. For example, while *Sarcochilus* Fitzhart is a much-used parent, the hybridist may favour a particular cultivar, e.g. *S.* Fitzhart 'Super Centre', for its specific attributes. Registered hybrid lists, unfortunately, do not show the cultivar name, but for the cross to be 'an exact copy' of another hybrid this detail is important.

Starting out

Where to start is an unavoidable question faced by budding *Aeridinae* hybridists, and a decision is usually reached by observing the achievements of those more experienced. Their hybridising work may have developed along certain specific lines, such as improving reds or yellows, but some are happy to simply produce quality offspring in a range of colours, patterns, shapes and sizes. Whatever their aim, each breeder will be conscious of the need for a plant to have a good floral display and overall attractiveness to offset the diminutive size of the individual flowers. Apart from the breeding of the 'classical' types we are seeing a rising popularity of 'novelty' *Aeridinae* in all their shapes and colours, which may see them favoured by some breeders, while to others they remain but an interesting diversion. After all, if the seedlings of a 'classic' cross turn out to be somewhat of a let-down there's a chance of calling it a 'novelty', with possible acclaim, or even declaring it a new direction in one's breeding program!

Not unlike fishing, hybridising within *Aeridinae* can be a most enjoyable activity, where the listener is regaled with stories of successful ventures and amazing results. While there may certainly be highlights the reality is that, like fishing, there can be a lot of water between each fish. Or put more simply, patience and perseverance pay dividends, especially when crossing two complex hybrids or breeding inter-generics.

As noted above, chances of success are improved by the wise choice of parents, but there are other aspects to also keep in mind. Following flower pollination in late spring,

S. hartmannii 'Ginger'

S. hartmannii 'Red Snow'

S. Misty 'Spangles'

S. Velvet 'Cool Dude'

S. Duno Nicky's Twin 'Eloise'

S. Duno Nicky's Twin 'Mel'

seed capsules usually take several months to mature, and so may need extra care through the heat of summer. The seed capsules, being susceptible to insect and fungal attack, should be closely watched and protected because, as every hybridiser knows, the lost capsule is usually the one with the most potential. Pitfalls more difficult to avoid are seed capsules not forming, or not being carried by the plant to maturity. Where the capsule is not at the end of the fully-developed raceme there is a tendency for the raceme to die back, with the chance the die-back may not stop in time. To ensure the capsule is not at risk it is usual to revisit the plant and pollinate the end flower when it forms.

Flasking

Once seed capsules have reached maturity, the seed is sown into mother flasks using sterile techniques. The usual methods of seed sowing are 'dry seed' and 'green pod'. The latter is the preferred method for several reasons, the main one being that capsules often contain a paucity of seed, and by this method no seed is lost. It is also quicker and more efficient, because the capsules contain a mixture of seed and fibrous 'fluff', and the 'dry seed' method requires these to be separated out before the seed can be sterilised. For an understanding of preparation methods it helps to have an appreciation of the minuteness and lightness of orchid seed which, being only an embryo enclosed in a papery husk, is in nature dispersed by being carried on the wind.

Parents

Most growers who harbour thoughts of creating their own crosses plan to pass their seed capsules on to a specialist laboratory and wait some months until they are rewarded with flasks of beautiful seedlings. These seedlings are then planted out and the grower eagerly anticipates first flowering. Having enjoyed the ups and downs of hybridising for over 25 years, my experiences may be helpful, and make the foregoing a bit more specific, especially in regard to the discovery of 'parent' material. The most significant plants which were to prove the foundation of my breeding were *S. hartmannii* 'Red Snow' (a gift from Ken Russell), *S.* Velvet 'Cool Dude' (bred by Neil Finch, and a gift from Ron Formby), *S.* Fitzhart 'Super Centre' (*S. fitzgeraldii* 'Top Red Centre' x *S. hartmannii* 'Billy') bred by Neil Finch, *S.* Misty 'Spangles' bred by myself, and lastly *S. hartmannii* 'Baby BS #2' and *S. hartmannii* 'Baby BS Wow'. All of these have been involved, directly or indirectly, in the creation of many of the more recognisable hybrids we see today.

Sarcochilus hartmannii 'Red Snow' HCC/ANOS
Although a typical red-centred Numinbah form of *S. hartmannii,* Ken Russell found that when 'Red Snow' is crossed with another red-centred flower it occasionally produces yellow-centred progeny, and further breeding over many years has given full yellow and even orange flowers.

Sarcochilus hartmannii 'Ginger Snow'
This was a superior seedling from the cross *S. hartmannii* 'Yellow Snow' x *S. hartmannii* 'Red Snow', which had perfect rounded floral segments and a glistening ginger coloured centre. It soon became the pollen parent of choice for yellow-breeding based on *S. hirticalcar*, as it improved flower size without diluting colour.

Sarcochilus hartmannii 'Baby BS #2' AM/ANOS and *S. hartmannii* 'Baby BS Wow'
These are superior seedlings from the selfing of *S. hartmannii* 'Bee Ess', having similarly robust flowers, but in other ways being an improvement on the parent. In breeding, they enhance flower size and shape while mostly letting yellow colours through, and achieve outstanding results when crossed with reds to give the likes of *S.* Nicky's Twin Bees 'Bulls Eye'.

Sarcochilus Misty 'Spangles'
There were only five seedlings from the cross (*S.* Aussie Dawn x *S.* Riverdene) of which *S.* Misty 'Spangles' stood out and was to become a most important parent in the breeding of *S. hirticalcar* derived yellow hybrids. Six hybrids have been registered, the best-known being *S.* Galaxy (x *S. hartmannii*), *S.* Lara (x *S.* Tin Yin

Plchs. Scallywag '#1'

S. Allure 'Good Upright'

S. Allure 'Pink'

S. Bessie 'Red Centre'

S. Erin 'Goodo'

S. Evening Star 'Bold Red & Gold'

S. Magic 'Vo-Vo'

S. Nicky's Twin Bees 'Bulls Eye'

S. Galaxy 'Cute'

S. Tomas Kinsella 'Red & White'

S. Lustrous 'Nice'

S. Magic 'Regal Red'

Lara), and *S.* Misty's Twin (x *S.* Duno Nicky's Twin). The demise of *S.* Misty 'Spangles' curtailed matters somewhat, but left the legacy of *S.* Galaxy, which has proved an invaluable parent in the breeding of yellow colours. The flowers of *S.* Galaxy are a full yellow except for red in the centre, a characteristic which distinguishes them from the yellow hybrids derived from *S. hartmannii* 'Red Snow', and these two distinct breeding lines are now being combined to give growers an ever-expanding palette of yellow and orange colours.

Sarcochilus Duno Nicky's Twin

The hybrid *S.* Nicky x *S.* Fitzhart was registered by DUNO, and it was later remade by myself in 1998, specifically GV 769 (*S.* Nicky '#3' x *S.* Fitzhart 'Super Centre'), which produced 42 widely distributed flasks from which developed two entirely different styles of offspring. Most seedlings were rather small flowered and strappy, but an occasional seedling ticked all the boxes, and it soon became apparent that a few plants carried vastly superior flowers evident even in the bud stage. These flowers were well-textured, of good size, circular filled-in shape and a rich red-purple colour. Of significance too was the large, red-barred yellow labellum, a result of its' *S. hirticalcar* ancestry, which provided balance to the flower. From this later GV769 cross came the significant cultivar *S.* Duno Nicky's Twin 'Eloise' AM-AD/AOC, which has proved its value in breeding as either the pod or pollen parent, as it reliably produces top-quality offspring. A few such hybrids are: *S.* Allure (x *S.* Elegance), *S.* Tomas Kinsella (x *S.* George Colthup), *S.* Erin (x *S.* Snowhart), *S.* Evening Star (x *S.* Galaxy) and remakes of *S.* 'Magic' (x *S.* Zoe).Most have received quality awards and are now themselves being assessed as future parents. Of interest too is the novelty intergeneric hybrid *Plectochilus* Scallywag (x *Plectorrhiza tridentata*), an attractive flower in shades of red/brown highlighted by a large sculptured labellum.

Sarcochilus Velvet 'Cool Dude'

The influence of *S.* Velvet in breeding is evident in the way *Sarcanthinae* hybrids are being exhibited throughout the year. Seldom without a flower, plants of *S.* Velvet brighten up the shade house even in the dullest months, and this trait often passes on to their offspring. Breeding with it can be a bit frustrating until an amenable parent is found. *Sarcochilus* Velvet 'Cool Dude' is happy as either pod or pollen parent, is red-brown rather than the usual purple colour, and produces quality offspring such as *S.* Amelia (x *S.* Duno Nicky's Twin), *S.* Bonanza (x *S.* Fitzhart), *S.* Bessie (x *S.* George Colthup), *S.* Lustrous (x *S.* Elegance), *S.* Surprise (x *S.* Galaxy) and *S.* Velvet Mist (x *S.* Misty).

Finally

We all like a challenge, and from the outset a particular goal of mine was to breed yellows of good quality, sufficient to see them regarded as 'classics', and shown the respect accorded other exhibition-style flowers. Careful hybridising over five generations has achieved the sought after 'classic' flowers of good size, round filled-in shape, a rich even yellow colour highlighted by a red centre, and for a bit more embellishment, a prominent yellow labellum. Along the way also emerged the richly coloured reds, and albinistic yellow 'classics' so evident today.

The past years have obviously been a rewarding time for growers and hybridisers alike, but with each year's fresh crop of seedlings come new colours and patterns, shapes and size, all making the present a great time to get amongst the action. Provided a new batch of seedlings is added to the collection each year, the grower soon enjoys the anticipation and excitement of maybe seeing a future champion flowering for the first time. While seedlings can be readily purchased either separately or in flask, there are many who prefer to do their own thing entirely, or at least to try a bit of hybridising while outsourcing the sowing of the seed. Either way, enjoy the journey!

David is a highly experienced and successful breeder of Australian orchids.

Flasking Australian Orchid Species for Conservation

Roslyn Capell
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Introduction

ANOS founding president, Bill Murdoch, spoke on "Conservation of Native Orchids" at the first Australian Orchid Conference in Brisbane in 1967. An article he wrote for *The Orchadian* about that presentation was reprinted in the June 2006 issue. Among other things, he said increasing interest in our orchids had established a keen demand and said that, "wholesale gathering appears to be the order of the day. Huge quantities are finding their way into our chain stores and other purchasing places, under conditions that entirely preclude their chance of survival. Indeed many plants require such expert knowledge and exact conditions for successful growing, that the sales amount to nothing less than blatant exploitation". He added that the Queensland government's selection of *Dendrobium bigibbum* as its floral emblem in 1959 had actually condemned thousands of plants to death.

Dr P.S. Lavarack also wrote about the effect on the Cooktown orchid of its proclamation as floral emblem. In a 1977 article he said that "Despite the fact that the habitat of this plant remains virtually untouched, its numbers have now been reduced very significantly in many areas. It is now no longer to be found near Cooktown and, in other places like Princess Charlotte Bay where it was once abundant, it is now becoming scarce. It is not uncommon to see plants offered for sale in newspapers – sometimes in lots of 100. Plants are often sold in chain stores to people who have no idea of how to grow them" (Lavarack 1979). Many readers will recall the notorious photograph of a station-wagon crammed full of confiscated, illegally-collected plants of *Dendrobium bigibbum* which accompanied an article by Dr. Lavarack in the *Australian Orchid Review* in 1998.

Bill Murdoch advocated a vigorous policy of raising seedlings as a means to save orchids - "When seedlings can be made available without cost or even at a nominal price, then we may expect to see the urge of the collectors to rob our forests, a thing of the past". Conservation was one of the factors which motivated the founders of ANOS and it inspired some prominent early breeding programs. Ira Butler started hybridising orchids to encourage conservation and discourage illegal bush gathering (Kerr 1991). Ted Gregory began breeding plants and giving them away in the hope of cutting down the thieving from the bush (Gregory 1990).

Over the years others have also championed the flasking of seed to produce species for cultivation by hobbyists to take the pressure off wild populations, and I want to add my voice to this cause. The majority of trade in orchids focuses on epiphytes and lithophytes, and this article was written with those in mind.

Conservation by Propagation and Cultivation

A number of breeders took up the challenge and some of the showier and most popular species such as *D. speciosum, D. bigibbum, D. kingianum* and *Sarcochilus hartmannii* have now been propagated for over forty years, and are commonly listed in the catalogues of orchid nurseries. A burst of breeding with *S. ceciliae* in the 1980s led to it becoming widely available. The seedlings often produced larger and more open flowers than their wild-collected parents, and plants grew in a wider range of conditions, which is often the case with seedlings produced in flask. Seedlings of some other species, such as terete-leafed dendrobiums and *D. tetragonum*, can also be found in nursery lists.

However, most breeders have tended to concentrate on a limited range of species, and often the smaller-flowered species only become available when divisions of a large

plant are offered by a grower who has had it for many years. Most of these plants were collected from logging sites under salvage permits, and those sites have long since been built on, or ploughed for agriculture. The plants in cultivation may be the only survivors of their populations. I would like to see more of these small species, and a wider range of species generally, propagated from seed. A lot of the smaller epiphytes such as Australian bulbophyllums and the epiphytic *Sarcochilus* species and their relatives, are fairly easy to grow, and could form the basis of an interesting collection for people with limited space, if they could get them.

Producing seedlings for reintroduction to the wild is a totally different kettle of fish, and not something for the hobbyist to dabble in. Seedlings produced for horticulture have no place in the bush, and should never be planted there by amateurs in the misguided belief they are doing something for conservation of the species. Conservation translocation is a specialist field which should be left to the professionals at universities and botanic gardens. Several states have programs for propagation of rare and endangered terrestrials, identifying and isolating the appropriate fungal species, and reintroducing seedlings into their habitat.

Line breeding

The term "line breeding" is often used to refer to any species cross made in cultivation, however the term has a technical meaning and does not really apply to many of the situations it is used for. It does not apply to a crossing made between plants of different varieties of *D. speciosum*, or even two unrelated plants of the same variety, or to selfings, or when two unrelated plants of any species are crossed. Line breeding is a sort of inbreeding between closely related plants over a number of generations, using parents selected to concentrate desirable traits inherited from a common ancestor, to develop a line of plants with 'improved' characteristics. *Dendrobium kingianum* has been line bred in this sense, to improve shape and size and floriferousness, as well as selected colours. *Sarcochilus hartmannii* breeding has been heading in that direction with the crossing of plants of the progeny of the 'BS' selfings. "Artificially propagated" is probably more appropriate than "line bred", but it is unwieldy and also covers propagation by division or mericlone. "Line breeding" is a very handy term that can be used in a loose sense to signify a plant pollinated by toothpick in the greenhouse, rather than an insect in the bush.

Sourcing Flasks

An internet search will find a number of orchid nurseries that supply flasks of Australian species. ANOS Kabi Group's web site contains a useful list of sources. Flasks usually have to be ordered in advance, in a size that suits the purchaser: hobby flasks for individuals and larger flasks for societies to share among their members. Societies could sow seed and produce flasks as a society activity, perhaps also collaborating with other clubs to produce and swap flasks.

The Australian Orchid Foundation has had a seed and protocorm bank for decades, as a conservation measure and to fund their orchid research projects. There was an extensive and tempting range of epiphyte seed available in earlier days. Their seedbank offerings listed in *The Orchadian* in September 1979 included *Bulbophyllum baileyi*, *Bulbophyllum wadsworthii*, *Cadetia maideniana*, *Cymbidium canaliculatum*, *Cym. canaliculatum* var. *sparkesii*, *Cym. madidum* (light and dark colour forms), *Dendrobium aemulum* (two forms), *D. affine*, *D. agrostophyllum*, *D. antennatum*, *D. bifalce*, *D. bigibbum* var. *superbum*, *D. bigibbum* var. *compactum*, *D. cancroides*, *D. cucumerinum*, *D. discolor*, *D. monophyllum*, *D. nindii*, *D. ruppianum* var. *magnificum*, six different forms of *D. speciosum*, *D. smilliae*, *D. teretifolium* from three different sources, *D. tetragonum* var. *giganteum*, *D. tetragonum* var. *tetragonum*, *D. tozerense*, *D. wassellii*, *Eria queenslandica*, *Phalaenopsis amabilis* var. *rosenstromii*, *Pomatocalpa macphersonii*,

Sarcochilus falcatus, S. hillii, Rhinerrhizopsis moorei and *Vanda hindsii.* The current AOF seed bank list is much smaller and contains relatively few epiphytes. Why is that? Growers were producing seed on their orchid species back in 1979, and they can do it now. They could follow the guidelines on the AOF site and submit their seed to the seed bank, or deal directly with a flasking service of their choice and have the seed sown and flasks produced.

Legislation and Penalties

Sadly, Bill Murdoch's hope that ready availability of seedlings would stop people from ripping them from the bush was overly optimistic. Nursery-raised seedlings were snapped up but wild populations in accessible areas continued to be raided and depleted, despite the risk of increasingly heavy fines. Australian orchids are protected throughout the country and have been for many years now. It is illegal to take native orchids from the bush anywhere without a permit or under a specified exception. The orchid species most commonly cultivated or used in hybridising in Australia are species native to New South Wales and Queensland, and it is only those states' legislation that I will reference.

Orchids and other plants are protected in New South Wales in the *Biodiversity Conservation Act 2016* and the 2017 Regulation. The maximum penalty for illegally taking an endangered species out of the bush (e.g. *D. tetragonum* var. *melaleucaphilum* and *S. dilatatus*) is $330,000 for individuals and/or imprisonment for two years. For a vulnerable species (e.g. *S. hartmannii* and *Oberonia titania*), the maximum penalty for individuals is $88,000, and for orchids that are not listed as threatened (e.g. *D. kingianum* and *D. speciosum*) the maximum penalty for individuals is $22,000. On top of this, there is a separate penalty of 10% of the main penalty for each plant taken. The monetary penalties for corporations are even higher than those for individuals. These are just the penalties for taking or "picking" them (and note that "pick" expressly includes "remove from the ground"). These are also several other offences, such as dealing in plants that are threatened species and damaging the habitat of a threatened species, and ancilliary offences such as aiding or abetting or procuring another person to commit an offence under the legislation, and for failing to comply with the requirements relating to the tagging of protected plants.

The Queensland legislation (Section 89 of the *Nature Conservation Act 1992*) provides for a range of similarly heavy maximum penalties. At the top of the scale, the maximum penalty for illegally taking one or more plants of an endangered species (e.g. *D. antennatum* and *D. nindii*), or five or more plants of a vulnerable species (e.g. *D. johannis* and *D. bigibbum*), or 10 or more plants of any orchid species that is native to Queensland but not listed as a threatened species in that state (e.g. *D. speciosum* and *Sarcochilus falcatus*) is $391,650 or two years imprisonment. At the other end of the scale, illegally taking one plant of an orchid species native to Queensland that is not a threatened species in that state attracts a maximum penalty of $21,540. It is a separate offence to use or keep plants that have been taken illegally, and the same penalties apply to this offence as to the taking of the plants. The Act's definition of "take" includes "gather".

The threat of those penalties should give pause to anyone who is thinking of taking plants from the bush. However, the fact that the penalties are so severe does not mean our state governments want to discourage enthusiasts from growing native orchid species any more than they want to stop gardeners growing grevilleas. They know that horse has bolted; they just want to stop us stripping the rest of the plants from the wild, in the hope of ensuring that what is still there remains there, sacrosanct. The New South Wales *Whole Plant Management Plan 2018-22* (OEH 2017) acknowledges that harvesting and propagating orchids is an established part of the whole-plant industry. It goes on to say that "OEH supports a transition to propagated material through ending wild harvest for all orchids that can be cultivated". Queensland's

Figure 1. **Logging areas, north of Port Macquarie, New South Wales. Photos Peter Adams.**

Strip clearance of wet sclerophyll forest.

Cleared area with log pile.

Cleared area marked for a road, with exposed palms (*Archontophoenix*) and rainforest.

Intact rainforest with palms and lianes, creekside below cleared forest.

Figure 2. **Logging areas, north-west Tasmania. Photos Craig Broadfield.**

Clear felling of mixed forest with tree ferns (*Dicksonia*) exposed at margins.

Clear felling of forest with *Melaleuca* paperbarks and remnant tree ferns.

Burnt area following forest clearance, with preparation for plantation timber lot.

management plan (DEHP 2014) states, "To reduce collecting pressure on wild populations, this plan encourages the propagation of native plants from seed or other propagating material and allows these plants to enter the trade with only minimal restrictions needed to verify that the plants are from legal sources."

The Bill Murdoch Trophy

The Autumn 1992 issue of *The Orchadian* announced that ANOS Council was considering the initiation of a new award, of similar prestige to the Ira Butler Memorial Trophy, to encourage the line breeding of horticulturally superior species, with a view to eventually making bush-collected species non-competitive in shows and exhibitions. At about that time, Newcastle ANOS Group requested that such a trophy be introduced to honour Bill Murdoch, who had passed away in 1989 at the age of 94. The first Bill Murdoch Trophy was awarded in 1993 and many of the entries over the years have been artificially propagated seedlings. I urge the owners of entries which were originally wild-collected to consider pollinating flowers on those plants to produce seed for flasking, to help make those species more widely available for enthusiasts to grow. This would be a positive step to further the aims which Bill Murdoch was passionate about, and an appropriate way to honour his memory.

Roslyn Capell is the ANOS Inc. Conservation Officer.

References:

Gregory T 1990 Australian native orchids towards 2000. *The Orchadian* 10:1.

Kerr R 1991 Way back of the bushhouse: A personal view of the beginning of ANOS. *The Orchadian* 10:4.

Lavarack PS 1977 Orchid Conservation – A Matter of Conscience. *The Native Orchid Bulletin (Qld.)*, November 1977, reprinted with permission in *The Orchadian* 6:3 (March 1979).

Lavarack PS 1998 Special Book Review of "Status Survey and Conservation Action Plan – Orchids". *Australian Orchid Review* 63:1.

Murdoch WH Reprint of article "Conservation of native orchids". *The Orchadian* 15:4.

State of New South Wales and Office of Environment and Heritage 2017 *Whole Plant Management Plan 2018-22 for the commercial harvest, salvage and propagation of protected whole plants*. Appendix I, https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Licences-and-permits/whole-plant-sustainable-management-plan-170679.pdf, accessed 30.9.18.

Department of Environment and Heritage Protection 2014 *Management Plan for protected plants in Queensland 2014-19*. Page 6, http://www.environment.gov.au/system/files/resources/0844f9ce-8e99-4edb-82ec-19fed5bec374/files/qld-plants-management-plan-2014-19.pdf, accessed 30.9.18.

Sarcochilus australis (with seed pod) exposed by clearance of surrounding cool temperate rainforest north-west Tasmania.
Photo Craig Broadfield.

Breeding and Culture of *Dendrobium kingianum* Style Hybrids

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Summary

The breeding of *Dendrobium kingianum* style hybrids, with strong growth, floriferousness, round shaped flowers, and white, pastel and purple colours began in the 1960s with *D.* Bardo Rose, *D.* Delicatum, *D.* Gillian Leaney and *D.* Kingrose. Hybrids were made combining *D. kingianum* and its primary hybrids with many *Dendrobium* species, resulting in 1224 hybrids up to 2018. In the 1980s and 1990s, breeding of *D. kingianum* style hybrids reached a peak, despite the focus shifting to *D. speciosum*, *D. tetragonum* and hot/cold *Dendrobium* lines. In the past 15 years registrations have steadily increased, with some hybrids composed of >80 % *D. kingianum*. At compositions of 40–70% *D. kingianum*, plants have more flowers and show a wide range of colours due to the influence of other species. *Dendrobium tetragonum* composition of ≥ 6% produces strong purple-violet colour on the tepals and usually the labellum. In the absence of *D. tetragonum*, white to mauve coloured flowers usually result. The Yarra hybrid series, using line bred *D. kingianum*, have produced compact, short to medium size plants. There is potential for further successful breeding, and remaking of older hybrids, using line bred *D. kingianum*.

Introduction

Early *Dendrobium kingianum* style hybrids were created in Australia with *D.* Bardo Rose (*D. falcorostrum* x *D. kingianum*, Overall 1961) and *D.* Gillian Leaney (*D.* Delicatum x *D. kingianum*, Leaney 1964). They may be defined as cool growing hybrids, where the dominant influence is *D. kingianum*, and plants are compact, relatively short, and floriferous, with flowers resembling *D. kingianum* in shape and presentation, but not necessarily colour. Some hybrids are difficult to classify. This hybrid style is easy to grow in southern Australia, as are other sect. *Dendrocoryne* species and hybrids, and flowers reliably in September to October.

Orchid shows in the 1970s and 1980s were dominated by very floriferous *D.* Bardo Rose, *D.* Delicatum and other *D. kingianum* style hybrids, with white to mauve flowers. A variety of colours is desirable to many growers, and white and pastel colours have appeal, and present a contrast to the stronger colours. There has been a resurgence of this style of breeding in recent years by breeders in New South Wales and Victoria, including east Gippsland. In this article I review the development of *D. kingianum* style hybrids and show the results of some emerging breeding lines that are producing plants of quality, some awarded.

As of 1/4/2018 there were 1883 Australian *Dendrobium* hybrids (Australian Orchid Registered Hybrid List 2018). Of these, 1244 (65%) have *D. kingianum* in their background. Background percentages do not necessarily indicate relative contributions of species in their progeny, due to differences in inheritance patterns, and expression of individual and groups of genes. Percentages are nevertheless useful to breeders as there is some relationship between higher percentages of composition, and the influence of species. *Dendrobium kingianum* tends to be dominant when the composition in hybrids is above 60%, but this can be modified depending on the relative influence of other species. Percentage compositions of 40–60% *D. kingianum* may produce *D. kingianum* style plants and flowers in some hybrids where the influence of other species is not profound.

Of the 289 *D. kingianum* style hybrids with >50% or more *D. kingianum* in their background produced up to 1999, about 20 have been used in a significant number of further hybrids. Well known parents include *D.* Bardo Rose, *D.* Delicatum, *D.* Ellen, *D.* Hastings and *D.* Yondi, all with 50 % *D. kingianum*. The low rate of further use of most early hybrids may be due to a view by breeders that the potential for further breeding is low, or a lack of interest in pursuing the potential lines. Most of the 115 hybrids with ≥62.5%

Figure 1. *Dendrobium kingianum* style hybrids with mauve coloured flowers.

D. Desert Rose

D. Hastings

D. Victorian Lady

D. Yarra Mist

D. Yarra Moon

D. You Beaut 'Icing Sugar'

background *D. kingianum* may be useful in producing compact hybrids and it may be mainly trial and error to determine which are preferable and the level of *D. kingianum* composition above which the plants are too similar to *D. kingianum* itself.

Early Breeding Phase 1960s to 1980s

Primary and secondary hybrids produced some vigorous and attractive plants, with a dominance of *D. kingianum* style flowers and growth form e.g. *D.* Delicatum, *D.* Bardo Rose (Overall 1961), *D.* Gillian Leaney (Leaney 1964), *D.* Hastings (Cannons 1970) and *D.* Kingrose (Butler 1966). Much experimental breeding followed, crossing *D. kingianum* or its primary hybrids with a wide variety of plants and flower styles, including *D. speciosum*, *D. tetragonum* and warm growing *Dendrobium* sect. *Spatulata* species. The results were varied, with only a few continuing to exhibit *D. kingianum* characteristics. In the 1980s to 1990s, 29 and 32 hybrids respectively were registered with *D. kingianum* style flowers in a broad sense. These included *D.* Yondi (Batchelor 1982), *D.* King Leaney (Brandon 1984), *D.* Gulginni (Brandon 1983), *D.* Yondi Brolga (Batchelor 1988), *D.* Bicentennial Rose (Mitten 1989), *D.* Rutherford Blushing Bride (Smith 1993), *D.* Victorian Flare (Turville 1997), *D.* Kathryn Banks (D. Banks 1983) and *D.* King-Wong (Graham1987).

Early hybrids were also crossed with plants with different flower and plant styles, with a few continuing the *D. kingianum* style influence (Table 1). These include *D.* Aussie Quest (Spence 1985, 50% *D. kingianum*), *D.* Desert Rose (Sheen 1995, 50% *D. kingianum*), *D.* Bicentennial Blush (Mitten 1989, 62% *D. kingianum*) and *D.* Duno Deerose (DUNO 1998, 50% *D. kingianum*). An intersectional primary hybrid, *D.* Esme Poulton (*D. bigibbum* x *D. kingianum*, Poulton 1970), was produced on only one occasion. Plants of *D.* Esme Poulton have *D. kingianum* style floral and vegetative characteristics and grow in cool conditions despite the propensity of *D. bigibbum* to dominate in hybrids.

1990-2003

There were 32 hybrids registered in the 1990s and 22 hybrids in the 2000s, with Upton, Brandon and Turville the leading hybridists. A wide range of background *D. kingianum* composition was used, some with high percentages e.g. 87.5% in *D.* Bicentennial Rose. They produced attractive, pastel coloured flowers on short to medium sized plants. There were strong purple colours when *D. tetragonum* was in the background e.g. *D.* Zip and *D.* Tyabb. Some *D. kingianum* hybrids produced up to 2000 are listed in Table 1.

Eleven *D. kingianum* style hybrids were registered between 1990 and 2003, including five by Wayne Turville which contained *D. tetragonum,* seeking purple flower colour, with flowers in a style intermediate between *D. kingianum* and *D. tetragonum.* The hybrids of Neil Finch all had *D. tetragonum* in the background and did not produce *D. kingianum* style flowers. Trevor Smith's *D.* Rutherford Blushing Bride also contained *D. tetragonum. Dendrobium* Victorian Rose (Turville 1999) had a dominance of *D. kingianum* with no *D. tetragonum* content. It became clear that *D. tetragonum* tended to produce violet colours and starry flowers. The majority of breeders moved mainly to produce *D. tetragonum* and *D. speciosum* dominant hybrids, seeking more colour and higher flower counts, and to hot/cold breeding with *D. bigibbum*. Peter and Sheryl Adams deliberately began a *D. kingianum* style hybrid line with no *D. tetragonum* content, and continued it after regis tering *D.* David Adams (*D.* Yondi x *D.* Eureka, 25% *D. kingianum*) in 2003, and *D.* Les Adams (*D. kingianum* x *D.* Gracious Cascades, 50% *D. kingianum*) in the same year.

2004 to Present

Since 2004 there are hybrids with increasing percentages of *D. kingianum*, with 22 registrations in 2001–2010 and 19 in 2018. From 2000, there are many hybrids with more than 70% *D. kingianum* (Table 2). A group of hybrids produced in the first decade of the 21st C had 70–78% composition of *D. kingianum*, and might be expected to show a strong influence of *D. kingianum*, but it is difficult to

Table 1. *Dendrobium* hybrids with >62% *Dendrobium kingianum* in background 1964–1999.

Dendrobium hybrid	Pod Parent	Pollen Parent	Registration	Registrant	% *D. kingianum*
Rutherford Bluetongue	Bicentennial Rose	*kingianum*	1995	Smith T.J.	93.8
Pink Snow	Joy Wray	*kingianum*	1992	Wray S.	94
Bicentennial Rose	*kingianum*	Gillian Leaney	1989	Mitten D.	87.5
Kathking	*kingianum*	Kathryn Banks	1995	Finch N.	87.5
Victorian Flare	*kingianum*	Rutherford Blushing Bride	1997	Turville W.	84.5
Victorian King	*kingianum*	Zip	1999	Turville W.	81.2
Victorian Blush	June Mac	*kingianum*	1997	Turville W.	78.1
Kathryn Banks	Ellen	*kingianum*	1983	Banks D.	75
King Leaney	*kingianum*	Ella Victoria Leaney	1984	Brandon C.	75
Victorian Stripe	Victorian Flare	Zip	1999	Turville W.	73
Rutherford Blushing Bride	Gillian Leaney	Zip	1993	Smith T.J.	69
Yondi Brolga	*kingianum*	Peach Glow	1988	Batchelor S.	62.5
Zip	Ku-Ring-Gai	*kingianum*	1987	Skillicorn W.	62.5
King-Wong	*kingianum*	Wonga	1987	Graham R.	62.5
Bicentennial Blush	*Gillian Leaney*	Kim	1989	Mitten D.	62.5

Table 2. *Dendrobium* hybrids with >62 % *Dendrobium kingianum* in background 2000–2018.

Dendrobium Hybrid	Pod Parent	Pollen Parent	Registration	Registrant	% *D. kingianum*
Bright Angel	You Beaut	*kingianum*	2009	Batchman L.	87.5
Monakist	Cawongla	*kingianum*	2004	Brown M. & J.	87.5
Sundaani Flare	Rose Flare	*kingianum*	2016	Hockey P.	82.8
Two Kings	*kingianum*	King-Wong	2008	Santa Barbara	81.3
New Race	Bicentennial Blush	*kingianum*	2014	Edwards L.	81.3
Space Oddity	Tyabb	*kingianum*	2014	Edwards L.	81.3
Chalex	Marlo	*kingianum*	2014	Harrap R.	80.9
Metung	Warragul	*kingianum*	2007	Grech P.	80.5
Basil	Dainty Gem	*kingianum*	2000	Fisher W.	78.1
Walnut Valley King Gulginni	*kingianum*	Gulginni	2017	Rinke B.	75
Cracker	*kingianum*	Tie-Dye	2002	Mitchell N.	76
Yarra Plum	Yarra Quartz	*kingianum*	2018	Adams P. & S.	75
Red House	Desert Rose	*kingianum*	2014	Edwards L.A.	75
Nicsar	Donovan	*kingianum*	2010	Sargant N.	75
Yarra Ranges	Les Adams	*kingianum*	2009	Adams P. & S.	75
You Beaut	*kingianum*	Yondi	2003	Turville W.	75
Aussie Star	Gilleston Gem	*kingianum*	2009	Coppin R.	75
Finoca	Finlay	*kingianum*	2006	Grech P.	73.4
Enzed Aristocrat	*kingianum*	Red Squire	2000	Burgess D.	71.9
Top Class	Class	*kingianum*	2013	Butler D.	68.5
Neil Dougherty	Barbara Bohl	*kingianum*	2011	Garard T.	68.5
Harriet Tyson	Lusty	*kingianum*	2014	Woodend N.	68.5
Juliette Cooper	*kingianum*	Beauty	2010	McCulloch S.	66
Star King	Starsheen	*kingianum*	2011	Mitchell N.	64.8
Breeze	*kingianum*	Aussie Victory	2001	D.U.N.O.	62.5

Table 3. Some *Dendrobium kingianum* style hybrids with >62% *D. kingianum*, and back-crossed to *D. kingianum*.

***Dendrobium* hybrid**	**Second parent**	**% *D. kingianum***	**Flower Colour**
Bright Angel	You Beaut	87.5	mauve
Monakist	Cawongla	87.5	mauve
Sundaani Flare	Rose Flare	82.8	purple
Space Oddity	Tyabb	81.3	
New Race	Bicentennial Blush	81.3	mauve
Chalex	Marlo	80.9	
Metung	Warragul	80	purple
Basil	Dainty Gem	78.1	
Cracker	Tie-Dye	76.6	purple
Aussie Star	Gilleston Gem	75	
Walnut Valley King Gulginni	Gulginni	75	
Red House	Desert Rose	75	
Nicsar	Donovan	75	mauve
Yarra Ranges	Les Adams	75	
You Beaut	Yondi	75	mauve
Finoca	Finlay	73.5	
Enzed Aristocrat	Red Squire	71.9	
Harriet Tyson	Lusty	68.5	
Neil Dougherty	Barbara Bohl	68.5	
Top Class	Class	68.5	purple
Star King	Starsheen	64.8	mauve
Breeze	Aussie Victory	62.5	mauve
Yarra Charm	Valmai Charm	62.5	mauve
Yarra Mist	David Adams	62.5	mauve
Yarra Moon	Jesmond Gem	62.5	mauve

Table 4. *Dendrobium kingianum* style hybrids, flower colour and composition of *D. tetragonum*.

Colour of flowers	***% D. kingianum***	***% D. tetragonum***
Mauve		
Pink Snow	94	0
Bicentennial Rose	87.5	0
Two Kings	81.3	0
Nicsar	75	0
Yarra Ranges	75	0
You Beaut	75	0
Aussie Star	75	3
Yarra Mist	62	0
Yarra Moon	62	0
Victorian Lady	60	6
Desert Rose	50	0
Gillieston Gem	50	6
Hastings	50	0
Purple Marked		
Victorian Flare	84	6
Victorian King	81.2	12
Metung	80	12
Victorian Blush	78	6
Cracker	76	11
Victorian Stripe	73	16
Finoca	73	16
Tie-Dye x Cracker	63	17
Marlo	62	18.5
Warragul	61	23
Bounty	57	18.7
Julia	56.5	21
Tyabb x Desert Rose	56	26
Tyabb x Tania's Pride	53	6.3
Hunter Gem	50	15
Nanny Joy	16	26

see many of these plants and perhaps too early to fully assess the results. Many hybrids made in the past 10 years are still in the collections of their origins, and have not been seen by many others, or exhibited in such low numbers that only the breeders appreciate the degree of success or failure.

There are about nine hybrids to 2018 with more than 80% *D. kingianum*, produced by breeding back to *D. kingianum* (Table 3).These plants are likely to resemble *D. kingianum* strongly, and it will be interesting to see if they have distinct advantages, and if there is an influence from small amounts of *D. tetragonum*, *D. fleckeri*, *D. gracilicaule* and *D. speciosum*. Is there an upper limit after which increasing the percentage of *D. kingianum* becomes unproductive? Review of some hybrids with more than 80% *D. kingianum* in Tables 1 & 2 shows that they are very similar to *D. kingianum* in most respects, usually with white to mid mauve flowers of *D. kingianum* shape, labellar shape, presentation and flower count and size. Some have almost solid purple labellums or a white stripe down a purple labellum, which are very uncommon features in *D. kingianum*. These hybrids are perhaps not as attractive as the best line bred *D. kingianum*, and appear to have little particular advantage over the species. Hybrids containing 60–75% *D. kingianum* are generally easily recognised as *D. kingianum* style hybrids, with some variation in characteristics.

Characteristics of *Dendrobium kingianum* Style Hybrids

There is a wide range of plant styles, but they tend to be short to medium sized plants compared with the range of cool growing *Dendrobium* hybrids. Leaf size ranges from that of *D. kingianum* to at least twice the size. This applies similarly to leaf length, the range grading into that of hybrids with the large leafed *D. speciosum* influence.

The racemes are short to medium length, erect or arching, and following *D. kingianum* are often just above the foliage, sometimes partly covered by the leaves. The flowers are concave, rounded or resembling a half circle in outline, similar to the shape and characteristics of southern plants of *D. kingianum*. Colours range from pure white to splash mauve, mauve and occasionally purple, as well as brilliant pastel shades. If dominant species such as *D. tetragonum* are in the composition there may be deep purple bars, outlines or spotting on the tepals, and a more star-like shape. Labellums vary but are often marked with purple-mauve spots and bars, usually unlike the patterns seen in *D. kingianum*. There is a more restricted range of midlobe shapes than in *D. kingianum* (Adams and Lawson 1995). In a successful hybrid the overall appearance is a compact plant with attractive white, pastel or mauve flowers presenting well over the whole exhibit.

Breeding by Crossing Back to *Dendrobium kingianum*

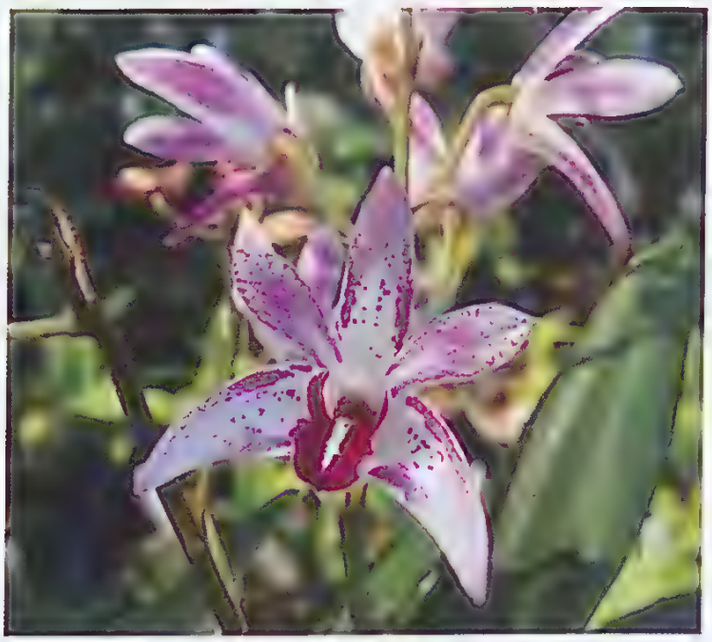
Hybrids with high percentage *D. kingianum* may be made by crossing hybrids which each have relatively high percentage *D. kingianum*, or by crossing back to selected *D. kingianum,* which dramatically increases the *D. kingianum* influence. Table 3 lists hybrids made by crossing back to the species. The progeny resemble *D. kingianum* in flower shape and presentation. Most use section *Dendrocoryne* hybrids but occasionally the hybrids used contain low percentages of *D. bigibbum* (sect. *Phalaenanthe*). Colours are variable, and generally follow the influence of *D. kingianum* and *D. tetragonum*, as in Table 4. Insufficient results are available to compare the backcrossing approach with other breeding strategies.

Influences on Flower Colour and Shape

There are two main flower colour groups in *D. kingianum* style hybrids: mauve to splash mauve, and flowers with strong purple areas on a white background, often associated with a predominantly purple-violet labellum. The flower shape is mainly influenced by *D. kingianum*, and the tepal colour is dominated by *D. tetragonum* at compositions of about 6% or greater (Table 4). In the mauve coloured group (Fig. 1), *D. tetragonum* was mainly absent, except in three with 3–6%. Caution needs to be taken in stating more than a general trend, as the number of progeny of crosses available to assess was often only one to

Figure 2. *Dendrobium kingianum* style hybrids with purple markings, *D. kingianum* 16–57%.

D. Bounty



D. Hunter Gem

D. Julia

D. Nanny Joy

D. Tyabb Rosy Cheeks x Tania's Pride

D. Tyabb x Desert Rose

several, and for some hybrids, no photographs or plants were available for study. An example of an unexpected result is *D.* Nanny Joy (with 16% *D. kingianum* and 27% *D. tetragonum*), where shape is similar to *D. kingianum* despite the low percentage. Some white and purple hybrids containing a background 50–60% *D. kingianum* have flower shapes closer to *D. kingianum* than those in the 60–80% group (see Figs. 2 & 3).

The Yarra Hybrid Series

In Yarra hybrids the absence of *D. tetragonum* preserves the rounded shape and pastel colours of *D. kingianum*. A comparison of vegetative and floral features permits some preliminary observations of the influence of *D. kingianum*. All plants are relatively compact, with short to medium canes (20–35 cm). The shorter plants, *D.* Yarra Ranges, *D.* Yarra Charm, *D.* Yarra Mist and *D.* Yarra Moon (62–75% *D. kingianum*), tend to have narrow canes and short to medium length inflorescences with 9–12 flowers. The strong influence of *D. speciosum* has also been avoided, except in *D.* Yarra Song, where the flowers are still *D. kingianum* style despite 18% *D. speciosum*.

Colours are similar to *D. kingianum*, white to mauve and purple, but the labellums are a different shape, many exhibiting striking fine purple (pepper spot) decoration on the midlobe. *Dendrobium* Yarra Quartz, *D.* Yarra Cloud and *D.* Yarra Song (38–50% *D. kingianum*) have longer canes and a wider flower colour range, including white, mauve, green lemon and combinations. Flower size is medium to large (30–37 mm diameter). The plants usually satisfy the breeding objectives of short, compact plants with a floriferous display of interesting and varied colours with good sized quality flowers. The Yarra series have received three quality awards, two from ANOS and one from AOC.

Culture

In Melbourne a solid roof will prevent excessive rain from causing rot, and protect from frost and subzero temperatures. Shading will depend on the amount of natural shade at the site, but around 50% is suitable. Further protection from cold is required if temperatures fall below –1°C.

Pot culture is best, squat or tall, depending on the characteristics of the plant. A variety of potting media is used. I use a mix of quality pine bark (60–70 %), scoria (10–15%) and vermiculite or charcoal (10–15%), topped with pea gravel to keep the medium in the pot. Repotting every 12–18 months into fresh media will keep plants advancing. I use a small amount of slow release fertilizer and Dynamic Lifter. Use quarter strength for any other fertilizers. Main pests are aphids on flowers and new growths, slugs and snails, and occasionally caterpillars, rats and mice. We do not have *Dendrobium* beetle down south.

Many hybrids grow in a compact urn shape, but train up any new growths that are growing too far sideways before they harden off, to ensure the canes are upright and present the racemes vertically and above the foliage.

Further Breeding

Many hybrids have the potential to cross back to line bred *D. kingianum*. To retain the *D. kingianum* style it is best to avoid hybrids with a significant component of *D. tetragonum* and *D. speciosum*, which theoretically may change the shape and slow the growth rate. Hybrids with relatively high flower counts and upright raceme presentation will give the best chance of quality plants. Superior line bred *Dendrobium kingianum*, with flower counts up to 7–9, tend to reduce the flower count in some hybrids. Seedlings should flower within 3–4 years, and develop optimum size within 6 years, which compares favourably with *D. speciosum* hybrids. Increasing the component of *D. fleckeri* in a hybrid, while keeping *D. kingianum* to less than 40%, may result in multi-coloured flowers, and possibly the much desired yellow flowers.

There is also potential to remake early and mid-period hybrids, such as *D.* Bardo Rose, *D.* Delicatum, *D.* Yondi, *D.* Bicentennial Rose and *D.* Bicentennial Blush as good starting points, using line bred *D. kingianum*.

References

Adams and Lawson 1995 Dendrobium kingianum. *A unique Australian orchid.* Queensland University Press, Rockhampton.

Australian Orchid Registered Hybrid List. ANOS Inc. January 2018.https://anos.org.au/dendrobiums/?igrex=&ispecies=No&ilist=List1&submit=select. Accessed 1st Nov. 2018.

Figure 3. *Dendrobium kingianum* style hybrids with purple markings, *D. kingianum* 61–84%.

D. Cracker

D. Finoca

D. Metung

D. Tie-Dye x Cracker

D. Victorian Flare

D. Warragul x Julia

Four New Papuan Species of *Dendrobium* section *Grastidium*

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Abstract

Four species of *Dendrobium* section *Grastidium* from the island of New Guinea are proposed as new, viz. *D. balimense, D. mambo, D. palmerianum,* and *D. tarawalla.*
Key Words. New Guinea, *Dendrobium,* section *Grastidium,* new species.

Dendrobium Sw., after *Bulbophyllum* Thouars, is the second largest orchid genus (*ca.* 626 species, including 6 hybrids) in New Guinea and nearby islands (Ormerod 2017). Among the 22 sections of the genus known to occur there, section *Grastidium* Blume is the largest with about 152 species, nearly all of which (147) are endemic. Continuing on from studies in the aforementioned work where 15 novelties were proposed, another four taxa are recognised as undescribed, and hereby described as new species.

As is typical of new species of section *Grastidium,* all four taxa are known from single collections. This is because the plants have short, erratic flowering periods that are usually restricted to mornings and seemingly occurring randomly at any time of year. So in effect a collector must be in the right place at the right time to catch the plants in flower. Thus 22 of the 23 taxa described from Papuasia since 1983 (de Vogel et al. 2014; Gilli 1983; Ormerod 2005, 2009, 2014, 2017; Schuiteman & Puspitaningtyas 2005) were each based on single collection. Furthermore, no subsequent collections of those taxa are known either.

Section *Grastidium* may generally be recognised by its slender leafy stems, biflorous, shortly peduncled inflorescences that emerge from 2–3, short, compressed sheaths, and ephemeral flowers. The section has about 216 species (new taxa included), with its centre of speciation in Papuasia.

Materials and methods

This study is based on dried herbarium materials, the flowers of which were rehydrated and then measured. Drawings of the rehydrated floral parts were made using a camera lucida microscope. The protologues of all species in section *Grastidium* in Papuasia were consulted, along with images or specimens (stated where relevant) of those taxa deemed most closely related to the entities under discussion.

Dendrobium balimense Ormerod, *sp. nov.* Figure 1.

Type: Indonesia, Papua Prov., Balim River, 1600 m, December 1938, *L.J. Brass 11687* (Holotype: AMES; Isotype: BRI).

Related to *D. aromaticum* J.J. Sm. but with leaves narrower (8.5-14.0 vs. 24.0-45.0 mm wide), the flowers with a broadly elliptic (vs. ovate-triangular) labellum epichile, and the callus on the hypochile lamellate (vs. a series of clavate to ellipsoid verrucae).

Epiphytic herb. Roots terete, to 1.2 mm thick. Stems caespitose, subterete, weakly transversely elliptic in section, laxly leafy, 25.7–36.5 cm long, 0.15–0.25 cm thick; internodes 1.2–3.0 cm long. Leaves lanceolate to oblong-lanceolate, apex minutely unequally to equally, obtusely to subacutely bilobed, coriaceous, 2.9–6.0 cm long, 0.85–1.40 cm wide; leaf sheaths tubular, striate, somewhat smoothly rugulose-subverrucose along nerves, exposed part 2.0–2.9 cm long, at apex opposite leaf blade with a deltate, subacute, 2.0-2.5 mm long lobe. Inflorescence 2, rarely 3 flowered, very short; primary peduncular sheath 0.2 mm tall, 3 mm wide; secondary peduncular sheath obtuse, 2.0–3.5 mm tall, 2–3 mm wide. Flowers yellow, speckled with purple. Pedicel with ovary clavate, glabrous, 5.5 mm long. Dorsal sepal narrowly oblong, obtuse, apical sixth cucullate with an irregular margin and verrucose exterior, 7 veined, 13.1 mm long, 4 mm wide. Lateral sepals obliquely oblong, obtuse, falcate, apical sixth cucullate with an irregular margin and carunculate exterior, 5 veined, *ca.* 11 mm long, 5.8 mm wide basally, 4 mm wide near apex, forming with the column foot a *ca.* 4.5 mm long

mentum. Petals obliquely spathulate, obtuse, apical sixth concave, 5 veined, 11.5 mm long, 4 mm wide. Labellum trilobed, *ca.* 8 mm long; hypochile broadly obdeltate, inside with some low transverse ridges on sidelobes, sidelobes truncate, *ca.* 4 mm long, 5.9 mm wide, medially with a lamellate, irregular keel that has on each side 3-4 verrucae in a parallel line; epichile broadly elliptic, subacute, margin irregular, with numerous low transverse ridges, medially with a line of jagged to irregular transverse plates or calli, *ca.* 4 mm long, 5 mm wide. Column short and broad, 2.8 mm long, 2 mm wide laterally; column foot slightly incurved, *ca.* 3.5 mm long.

Distribution: Indonesia (Papua Prov.).

Habitat: *Castanopsis* forest, 1600 m.

Etymology: Named after the Balim (now Baliem) River, near the type locality.

This taxon resembles *D. aromaticum* J.J. Sm. (illustrated Smith 1916) in that the flowers have apically incurved sepals with warty exteriors, and a broad, richly ornamented lip with small triangular sidelobe tips. It differs in that the leaves are about half as wide, and the lip has a broadly elliptic (vs. ovate-triangular) midlobe, with a lamellate keel (vs. a verrucose ridge) between the sidelobes that is not terminated by a cluster of processes. The calli on the medial line of the midlobe (epichile) of *D. balimense* are flattened, jagged, and oriented cross-wise, each resembling a miniature mountain peak.

Dendrobium mambo Ormerod, *sp. nov.* Figure 2.

Type: Papua New Guinea, Southern Highlands Prov., Kagua District, Erave, Mambo Ridge, 1250 m, 16 January 1981, *T.M. Reeve 986* (Holotype: AMES; Isotypes: CANB, E, K, L, LAE, NSW, UPNG, not seen).

Related to *D. rubropictum* Schltr. but the flowers with a labellum hypochile that has more or less truncate (vs. obliquely oblong-elliptic, obtuse and forward-pointing) sidelobes, and a glabrous (not verruculose) epichile.

Terrestrial herb. Roots, rhizome, and lower part of stem not seen. Stem fragment terete, sublaxly leafy, 20 cm long, 0.25 cm wide across leaf sheaths. Leaves linear-lanceolate, strongly unequally bilobed, gramineous, 9.5–11.0 cm long, 0.75–0.80 cm wide, shorter lobules 1.5–2.5 mm long, longer lobule 5.0–5.5 mm long; leaf sheaths tubular, striate, truncate, minutely subrugulose, densely black-spotted (epiphyllous fungus?), exposed part 1.5 cm long. Inflorescence short, 2 flowered, emerging halfway between leaves; primary peduncular sheath semi-elliptic, obtuse, 3.5 mm long, 4 mm wide; secondary peduncular sheath with exposed part *ca.* 3 mm long. Flowers white, dotted and suffused with pink-maroon, lip yellow, sidelobe edges coloured [label notes incomplete]. Pedicel with ovary clavate, 10 mm long. Dorsal sepal oblong-elliptic, subacute, apical quarter slightly concave and thickened, 5 veined, 14.5 mm long, 5.8 mm wide. Lateral sepals obliquely oblong-elliptic, obtuse to subacute, apex weakly concave, 5–7 veined, *ca.* 13.0–13.8 mm long, 6.5–7.5 mm wide basally, 4.8 mm wide midway, forming with the column foot a *ca.* 4.5 mm long mentum. Petals obovate-oblanceolate, obtuse, slightly thickened apically, 5 veined, 14 mm long, 5.6–5.7 mm wide. Labellum trilobed, *ca.* 9 mm long; hypochile obdeltate, margins crispate-undulate and interspersed with small oblong protuberances, inside each side with a few transverse lamellae, sidelobes truncate (front edge *ca.* 2.1 mm wide), *ca.* 4 mm long, 6.8 mm wide, medially with a high and lumpy callus just above base that then continues as a broad rumpled ridge midway on to the claw of the epichile; epichile transversely elliptic from a broadly clawed base, subacute, glabrous, 5 mm long (including claw 1.8 mm long, 2.2 mm wide), 5.9 mm wide. Column semiterete, apical margins broadly dentate, 4.6 mm long; column foot 4.0–4.2 mm long.

Distribution: Papua New Guinea.

Habitat: Limestone ridge, 1250 m.

Etymology: Named after the type locality, Mambo Ridge, and Mambo, a Voodoo Priestess, a reference to the enchanting nature of the flowers, and thus formed as a noun in

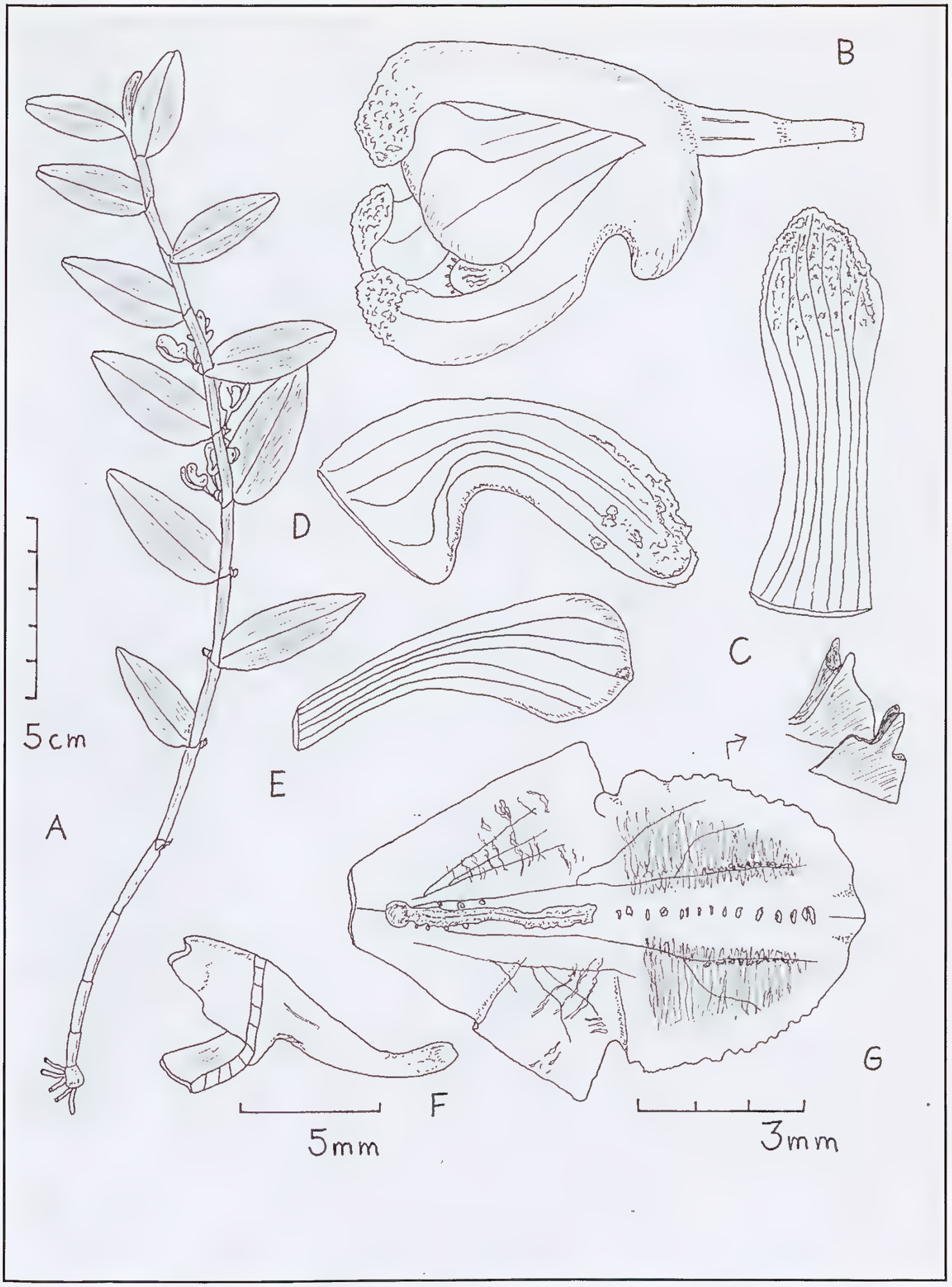

Figure 1. ***Dendrobium balimense*** – A. stem; B. flower; C. dorsal sepal; D. lateral sepal; E. petal; F. column; G. labellum (medial epichile calli arrowed). Drawn from holotype.

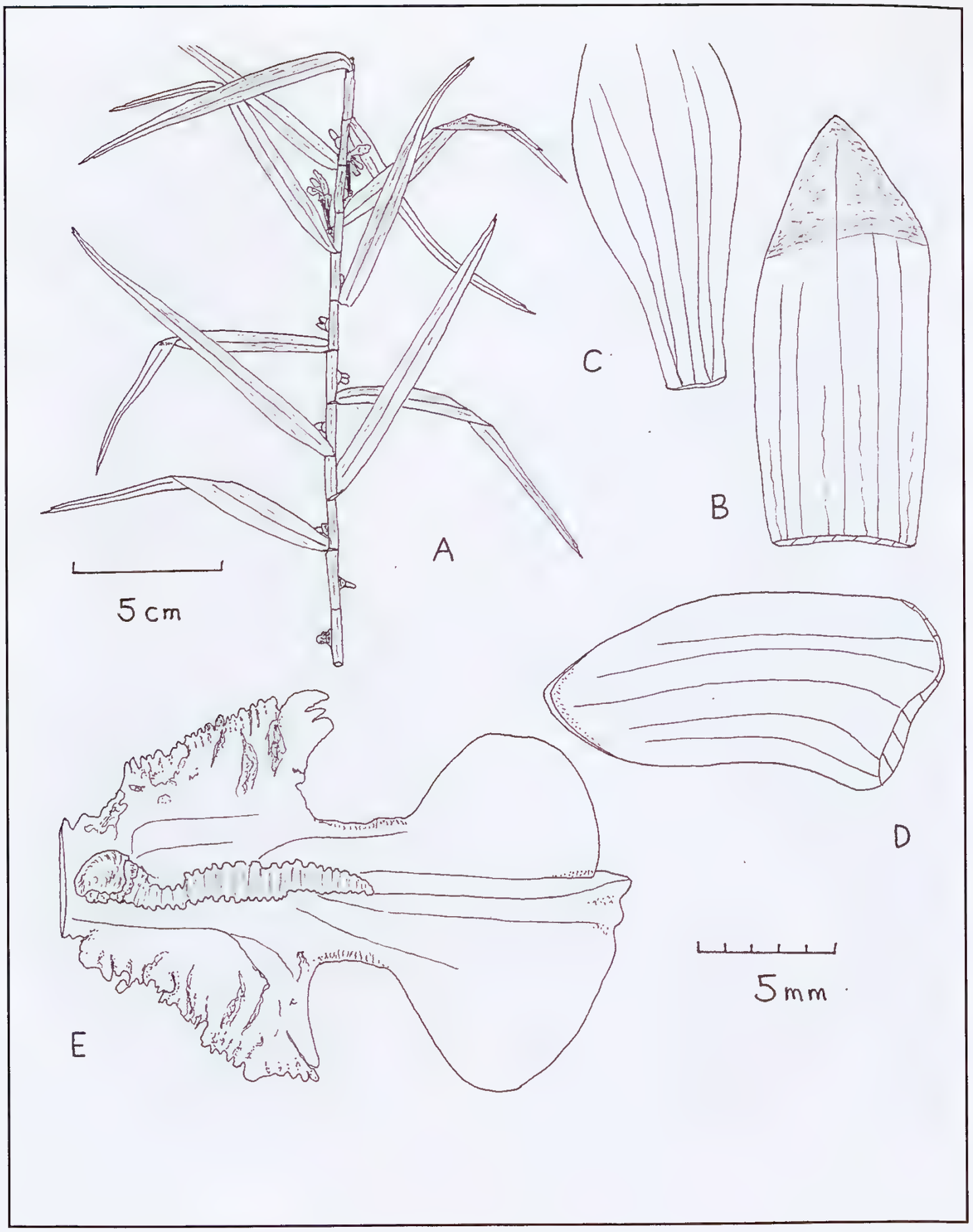

Figure 2. ***Dendrobium mambo*** – A. Stem fragment; B. dorsal sepal; C. petal; D. lateral sepal; E. labellum. Drawn from holotype.

apposition.

This species appears to be related to *D. rubropictum* Schltr. [illustrated Schlechter 1982. Syntype: Papua New Guinea, *R. Schlechter 19881* (B, destroyed; Isosyntypes: AMES!, NSW!; BO, G, L, S, not seen)] sharing with it grassy, linear-lanceolate leaves, relatively broad sepals and petals, and an apically widened labellum epichile. It differs in the labellum hypochile having more or less truncate (vs. obliquely oblong elliptic, forward-pointing) sidelobes, furthermore the epichile and claw are glabrous (vs. verruculose in a patch medially).
The column is not figured in the illustration provided because it was somewhat distorted in the pressing process and thus not suitable to draw.

Dendrobium palmerianum Ormerod, *sp. nov.* Figure 3.

Type: Papua New Guinea, Western Prov., Palmer River, 3.2 km below junction with Black River, 100 m, June 1936, *L.J. Brass 7038* (Holotype: AMES).

Related to *D. erectum* Schltr. but the flowers are smaller (sepals 15.8–18.0 vs. 27.0 mm long), the labellum hypochile with ovate (vs. ligulate-lanceolate) sidelobes, the epichile is ovate-lanceolate (vs. oblong), the medial callus dorsiventrally flattened in its lower half and then lamellate above (vs. lamellate throughout), and the column with ovate-lanceolate, acute (vs. truncate, minutely erose) lateral lobes of the clinandrium.

Epiphytic herb. Roots terete, to 1.5 mm thick. Stems caespitose, subterete, weakly transversely elliptic in section, slender, sublaxly many leaved, 33.2 cm long, 0.08-0.15 cm thick; internodes to 2.1 cm long. Leaves lanceolate, apex minutely unequally subacutely to acutely bilobed, one lobe up to 0.1 cm longer than the other, coriaceous, 3.6–4.8 cm long, 0.95–1.05 cm wide; leaf sheaths tubular, striate, longitudinal nerves raised and laxly verrucose, 0.8–1.05 cm long, at apex opposite leaf blade with a deltate, acute, 0.18–0.25 cm long lobe. Inflorescence 2 flowered, very short; primary peduncular sheath 1 mm tall, 2.6–3.0 mm wide; secondary peduncular sheath ovate, obtuse to subacute, minutely sparsely verruculose, 3.5–4.0 mm long, 2.5 mm wide. Flowers red [wilted?]. Pedicel with ovary clavate, 6 ribbed, black puncticulate [epiphyllous fungus?], 7.5 mm long. Dorsal sepal oblong in basal half, linear above, acute, 7 veined, 18 mm long, 2.8 mm wide. Lateral sepals obliquely and broadly linear-lanceolate, acute, 5 veined, 15.8 mm long, 5.6 mm wide, forming with the column foot a *ca.* 4 mm long mentum. Petals linear-ligulate, acute, 3 veined, 15.5 mm long, 1.7 mm wide. Labellum trilobed, 10.4 mm long; hypochile obovate-oblanceolate, inside each side adorned with long pubescence, sidelobe tips ovate, subacute, 6 mm long, 5 mm wide, medially with a callus that is dorsiventrally flattened in the lower half, then lamellate and two ridged in the upper half, ending in a free oblique point; epichile ovate in basal half, linear-lanceolate above, margins dentate, each tipped by a long, narrowly clavate hair, above densely beset with elongate hairs, 4.4 mm long, 2.8 mm wide. Column stout, conical, 2 mm long, 2 mm wide laterally; clinandrium with ovate-lanceolate, acute lateral lobes; rostellum absent; column foot *ca.* 4 mm long.

Distribution: Papua New Guinea.

Habitat: Forest (presumably near the river), 100 m.

Etymology: Named after the Palmer River, near the type locality.

This species appears to be related to *D. erectum* Schltr. (illustrated Schlechter 1982), sharing with it short lanceolate leaves, relatively short peduncular sheaths, and spidery flowers with a densely pubescent labellum epichile. It differs in having smaller flowers (sepals 15.8-18.0 vs. 27.0 mm long), a labellum with ovate (vs. ligulate-lanceolate) sidelobes, an ovate-lanceolate (vs. oblong) epichile, a medial callus that is dorsiventrally flattened in the lower and then lamellate in the upper half (vs. evenly lamellated throughout), and a column

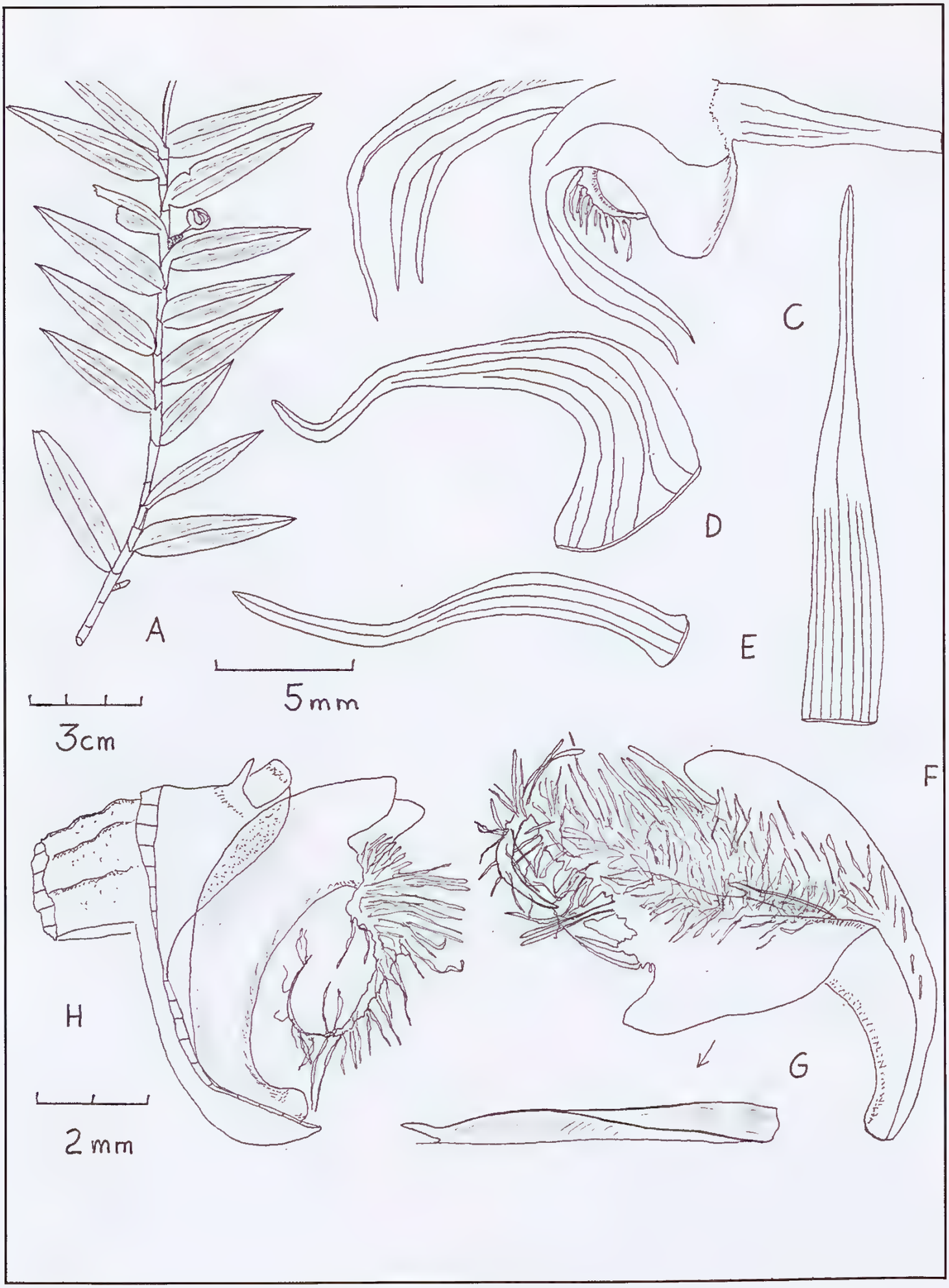

Figure 3. ***Dendrobium palmerianum*** – A. stem (upper part); B. flower; C. dorsal sepal; D. lateral sepal; E. petal; F. labellum (medial callus arrowed); G. labellum and column. Drawn from holotype.

with ovate-lanceolate, acute (vs. truncate and minutely erose) "stelidia" or lateral lobes of the clinandrium.

The flowers of *D. palmerianum* may be very short-lived or not open much because they are self-pollinating due to the column lacking a rostellum. When Les Brass collected the type specimen it seems the flowers were already wilted since they are curled up, and the colour was reported as "red", a common post-pollination colour in some ephemeral-flowered orchids.

Dendrobium tarawalla Ormerod, *sp. nov.* Figure 4.

Type: Papua New Guinea, Sandaun Prov., Aitape Subdistrict, along Bliri River, near Kaiye Village, 75 m, 17 July 1961, *P.J. Darbyshire & R.D. Hoogland 8157* (Holotype: A; Isotype: CANB, not seen).

Related to *D. erectopatens* J.J. Sm. but the flowers differ in having a labellum with distinct sidelobes (vs. elobulate), and on the inside of each side is an oblique, elongate irregular thickening (vs. thickening not present).
Epiphytic herb. Roots and rhizome not seen. Stems slender, transversely elliptic in section, elongate, densely leafy, 98.5 cm long (including a 63 cm long leafless portion), 0.1 cm thick, 0.2 cm wide across sheaths. Leaves lanceolate, apex obliquely bilobed, acute to subacute, obliquely erect, coriaceous, 3.2-3.7 cm long, 0.75–0.85 cm wide; leaf sheaths tubular, striate, apex obliquely truncate opposite leaf blade, 0.8 cm long. Inflorescence 2 flowered, very short; peduncle *ca.* 2 mm long; primary peduncular sheath 0.8 mm tall, 3.0–3.5 mm wide; secondary peduncular sheath *ca.* 2 mm tall, 1.5 mm wide. Flowers pale creamy yellow (in rehydrated flowers the callosities inside the sidelobes are purple coloured). Pedicel with ovary terete, 14.5 mm long. Dorsal sepal oblong, apex obtuse, apical part concave, thickened, 5 veined, 10.2 mm long, 3.5 mm wide. Lateral sepals oblong-elliptic, apex obtuse, apical part weakly concave, thickened, 6 veined, 9.5-10.0 mm long, 7.3 mm wide basally, 4.3 mm wide midway, forming with the column foot a *ca.* mm long mentum. Petals oblong-oblanceolate, apex obtuse, 5 veined, 8.8 mm long, 3.1 mm wide. Labellum trilobed, 7.5 mm long; hypochile obovate-oblanceolate, inside each side in upper half with an oblique carunculate thickening that extends onto the claw, sidelobes minutely pubescent before free tips, sidelobe tips obliquely deltate, subacute (0.3-0.5 mm long), *ca.* 4 mm long, 3 mm wide; epichile transversely elliptic-rhombic from a broadly clawed base, obtuse, below apex with a thickly bicarinate thickening, *ca.* 3.5 mm long (including claw), 4 mm wide. Column obliquely conical-subterete, apex minutely dentate, 3.7 mm long; column foot C-shaped, *ca.* 5 mm long (unstretched).

Distribution: Papua New Guinea.

Habitat: On small tree overhanging river, 75 m.

Vernacular name:Tarawalla (Orne Language, Kaiye Village).

Etymology: After the putative local name for this orchid, Tarawalla, and here used as a noun in apposition.

This species is related to *D. erectopatens* J.J. Sm. (illustrated Smith 1913), a taxon found nearby over the border in Indonesian Papua, and in the Sepik area. They share the same habit of long stems, short, lanceolate, obliquely erect leaves, flowers with relatively broad sepals and petals, and a similarly shaped lip. However, *D. tarawalla* differs in the labellum having distinct, free sidelobes (vs. absent), inside of which on each side is an oblique carunculate thickening (vs. absent), and a gently upcurved (in profile) labellum epichile (vs. apex recurved) which has a bicarinate thickening (vs. absent) below the apex.

Smith's (1913) expanded description of *D. erectopatens* describes the labellum as "subtrilobum" (i.e. almost three-lobed). His accompanying figure shows the lip in profile, but there are no free, forward-pointing sidelobes like those in *D. tarawalla.* His other figure of the lip shows it spread out from above,

from this it can also be seen that there are no free sidelobes but just a small erose area that merges into the basal edges of the midlobe.

Dendrobium tarawalla bears some superficial resemblance to *D. igneum* J.J. Sm. [illustrated Smith 1909. Syntype: Indonesia, Papua Prov., *G.M. Vertseeg1260* (Syntype: BO, not seen; Isosyntype: L, image seen)] but the latter differs in having more complanate stems, patent (i.e. spreading at right angles) leaves with broader, more auriculate bases, strongly oblique margins to the leaf sheaths (the free margins lead from the base of the leaf almost to the base of the next opposing leaf), flowers that have obovate-elliptic (vs. oblong-oblanceolate) petals, a broadly cuneate labellum epichile that terminates in a small reflexed barb (vs. a raised, bicarinate thickening), and has a median callus that is very narrow and lacks flared out edges in its lower half. It remains to be seen if the plants called *D. igneum* in culture truly represent that taxon because they differ from the type in having more terete stems, higher closing leaf sheaths, and flowers that have almost entire (vs. erose-lacerate) sidelobes, and an obovate-elliptic, broadly clawed epichile with a thick median band.

Acknowledgements

I wish to thank herbarium and library staff at BRI and NSW, and the Harvard University Herbaria (A, AMES, GH) for their help and hospitality during the research for this paper.

Paul Ormerod has studied and described new species over several decades, particularly from New Guinea.

References

de Vogel E., E. Winkel & R. van Vugt. 2014. *Dendrobium goodallianum,* a New Species of Section *Grastidium* from Papua New Guinea. *Malesian Orch. J.* 14: 87-90.

Gilli A. 1983. Beitrage zur Flora von Papua-New Guinea (Orchidaceae). *Ann. Nat. Hist. Hofmus. Wien* 84B: 15-42.

Ormerod P. 2005. A new *Dendrobium* Sw. of section *Grastidium* Blume from New Guinea. *The Orchadian* 51, 1: 11-13.

Ormerod P. 2009. Two New Species of Papuan Orchidaceae. *The Orchadian* 16, 5: 227-231.

Ormerod P. 2014. Papuasian Orchid Studies 4. *Malesian Orch. J.* 13: 37-68.

Ormerod P. 2017. *Checklist of Papuasian Orchids*. Nature & Travel Books, Australia.

Schlechter R. 1982. *The Orchidaceae of German New Guinea* (incorporating the Figure Atlas to the above). Translation of the German text from: *Die Orchideen von Deutsch-Neu-Guinea*. The Australian Orchid Foundation, Melbourne.

Schuiteman A. & D.M. Puspitaningtyas. 2005. *Dendrobium ianthinum* Schuit. & Puspita. – Eine neue Art aus der Sektion Grastidium aus Neuguinea. A new species of section *Grastidium* from New Guinea. *J. Orchideenfr.* 12, 2: 165-173.

Smith J.J. 1909. Die Orchideen Niederlandisch-Neu-Guinea. *Nova Guinea* 8, 1: 1-148. Plates 1-46. E.J. Brill, Leiden.

Smith J.J. 1913. Die Orchideen von Niederlandisch-Neu-Guinea. *Nova Guinea* 12, 1: 1-108, Plates 1-28. E.J. Brill, Leiden.

Smith J.J. 1916. Die Orchideen von Niederlandisch-Neu-Guinea. *Nova Guinea* 12, 4: 273-477, Plates 100-181. E.J. Brill, Leiden.

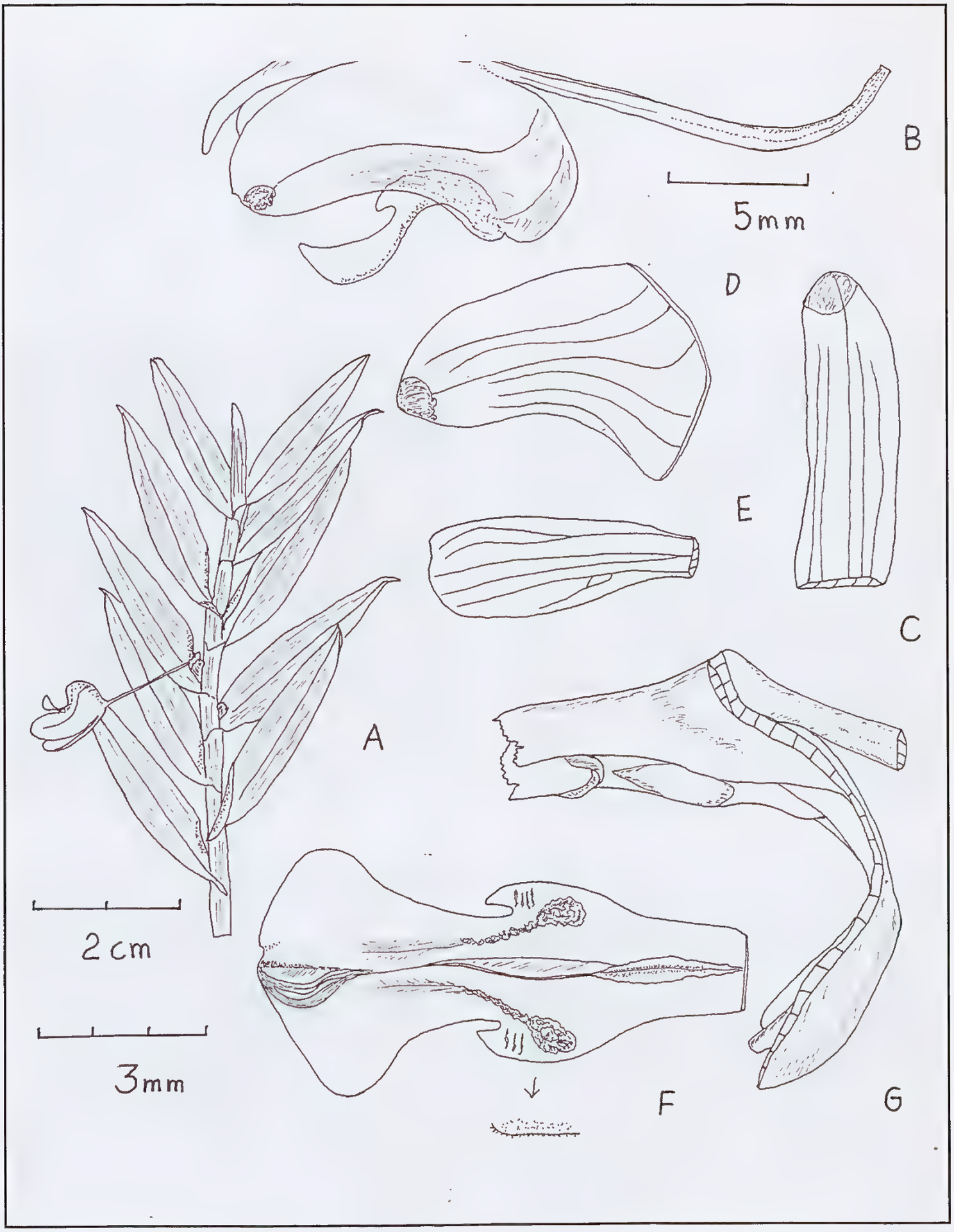

Figure 4. ***Dendrobium tarawalla*** – A. stem (upper part, less one flower); B. flower; C. dorsal sepal; D. lateral sepal; E. petal; F. labellum (detail of sidelobe arrowed); G. column and foot. Drawn from holotype.

Dendrobium section *Grastidium* (Blume) J.J. Smith

Editor's note

This section is large, with around 200 species which are tufted, wiry-stemmed plants with long-lived leaves. Most species are found in New Guinea. They have short inflorescences with 1–3 flowers borne at the side of stems which are enclosed at the base by persistent scale leaves. The small to medium sized flowers only last about one day. Five species are found in northern Queensland – *D. baileyi*, *D. cancroides*, *D. insigne*, *D. luceocilium* and *D. tozarense*.

In the paper by Paul Ormerod in this edition, line drawings have been supplied as there are no photographs, and the plants have not been seen for many years. The Australian species are illustrated here. It is hoped that the four new species described will one day be re-discovered, and we will be able to photograph and appreciate them.

D. tozerense. Photo P. Adams

D. insigne. Photo T. Porteous

D. baileyi. Photo J. Cara

D. insigne. Photo P. Adams

Herbarium Studies of New Orchid Species – Some Recollections

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Dried flowers have little appeal to most people, but they are occasionally used decoratively or as mementos. However, dried plants with their flowers are the bedrock of botany. Preserved specimens that are used to anchor the names of species are called types, whereas other collections are used to catalogue historical biodiversity. A museum devoted to preserving dried collections is an herbarium. Many of the orchids named in recent times are based on relatively recent specimens that are often accompanied by photographs of the living plant.

Many of the new discoveries I have made are from collections made only once many decades ago by collectors and explorers, and there have been no reported collections or sightings since then. Usually there are no drawings or photographs. Studying and naming these plants adds to our knowledge of the diversity of orchid groups. Some orchids may be rediscovered from this process, and some may be introduced into cultivation.

Herbarium work is not a perfect science, mistakes are made, specimens get misidentified, names get misapplied, and material may lay unidentified for many long decades. The destruction of herbaria is another impediment to research, whether it be during war, or by a misguided individual e.g. At the beginning of the 1940s the Berlin herbarium contained about 4 million valuable and historic specimens and most specimens were stored insecurely in rooms in the building. A sorting out of types and other authentic material was begun. Unfortunately, this was too late as the Herbarium building was destroyed by fire in a bombing raid in March 1943. e.g. Elias Durand in the mid 1800s bought the estimated 50,000 specimens of Rafinesque's herbarium by auction after his death, keeping only the small number he was interested in, and destroying the rest, including a very valuable collection of type specimens of grasses that Rafinesque had described.

Reconstituting specimens

Many plant families do not require the flowers of dried specimens to be rehydrated, but in orchids it is almost always necessary to reconstitute the blooms. Because of the vast diversity of the orchid family, it is necessary to treat the flowers of various orchids differently when it comes to rehydrating them. The method of bringing flowers back to life is much like cooking dried peas, once boiled they are almost the same as the original state.

There are a number of ways to reconstitute flowers. One is to use an ammonia (ammonium hydroxide) solution, which is very effective, but this is now not approved of by most herbaria because of the risk this chemical presents to human health and safety. Another method is to use a small amount of detergent mixed with water to act as a wetting agent, so that the dried flowers absorb water, and then boil or "cook" the flowers. Once the flower appears rehydrated it can be removed and placed in a small dish with a little bit of water to keep it plumped. This way the segments can be measured and drawn. Once studied the flower can be dried out again, or placed in spirit, depending on the discretion of the curator.

Looking at dried herbarium specimens

I would like to recount a few surprises that were found during my various researches over the years. One of these was found among a loan of unidentified 19th century specimens from Geneva (G). The material included Caribbean *Malaxis,* South American *Pleurothallis,* an isotype of *Nervilia ovata* from the Marianas, and a jewel orchid from Madagascar collected in 1836. Because there are so few Madagascan jewel orchids I thought the plant would be easy to identify, but no, it was undescribed and ended up bearing the name *Goodyera goudotii.* The sad thing is that no one has collected it since, and considering the environmental ravages in Madagascar, the plant is probably extinct.

More recently I did some work on *Dendrobium* section *Grastidium* from New Guinea. This group is of little interest to botanists and growers, though some of the species have quite attractive flowers. The problem is that the flowers are ephemeral, often wilting and being non-functional by midday. For the researcher this means that preserved specimens may not be in an optimal state when collected, plus the desiccated flowers are usually very delicate and cannot be boiled for too long, often less than a minute and with careful monitoring, otherwise they begin to break down. Within section *Grastidium* I decided to look at plants that seemed identical to *D. polyschistum.* These have slender stems with leaf sheaths that don't quite cover the stem, leaving a short, exposed area, narrow thin leaves, and spidery flowers. There are quite a few specimens from higher altitudes (above 2000 m) and I assumed these would belong to two or three species. Only after examining the flowers did it become apparent that this is a group that had speciated in the Papuan highlands, and that a hitherto unrecognised group had filled the upper montane niche.

I have done a lot of work on the jewel orchids (*Goodyera* and allies) but all of this stemmed from my first love, the orchids of New Guinea. The jewel orchids of the New World have doubled in number due in part to my studies. It wasn't my intention to do any intense study of them at first. I can still remember going through the unidentified *Erythrodes* at Harvard University with the idea of putting names on the material, but sheet after sheet turned out to be unnamed species. In the end type specimens outnumbered the regular non-type sheets.

As noted above New Guinea orchids are my first love. We have on our doorstep this beautiful land with rugged mountains clad in dense jungles, wild rivers, and at least 3000 species of orchids. The orchids of New Guinea present many difficulties when it comes to studying them, whether it is small flower size (*Oberonia* and *Phreatia*), floral similarity among the species (e.g. *Ceratostylis*), or the vastness of the genus at hand (e.g. *Bulbophyllum*), all complicated with the loss of Schlechter's original specimens at Berlin during World War 2. One of the final impediments to studying New Guinea orchids is the large amount of unidentified material. I have always been amazed at how many of Schlechter's species are not found among the unidentified herbarium sheets. This is another clue that New Guinea is a treasure house of diversity; it is truly the land of the unexpected.

So to sum it up, new orchids can still be found in herbaria, there are plenty there, the work just has to be done to find them. Despite working for 30 years with dry material I still love the living plants with their many and varied types of flowers, each with their own little charm.

The late Ray Robinson

Ray Robinson 17.8.1937 – 15.11.2016

Bill Lavarack (Buderim, Aug.2018)
lavarack@westnet.com.au

In 1980 I was transferred from Brisbane to Townsville by the Queensland National Parks and Wildlife Service. At the time I was told it would be for about three or four years, but it turned out to be 28 years. As a botanist I was given tasks of assessing areas on Cape York Peninsula as potential National Parks and researching rare and threatened plants. This latter task involved Australian orchids, which had always been a major interest of mine.

I was a member of the Australasian Native Orchid Society and the Australian Orchid Foundation, so I asked around for people in Townsville with similar interests. The first name which came up was Ray Robinson. Ray had been warned by the orchid network that I was coming to town, and I am now not sure who phoned who first. Anyhow we made contact and there started a friendship which was to last until Ray's passing in 2016. Ray was then working for South British Insurance and he insured our house at Pallarenda which Bev and I purchased a couple of months after moving to Townsville.

Ray had a very interesting collection of species orchids in the backyard of his Canara Street home. His interests mirrored mine in species, and native orchids in particular. In fact there would have been few better collections of species orchids in the state. One of my first memories of Ray was one morning near Bluewater Creek in Townsville's northern suburbs. There, in amongst the paperbark melaleucas, I met Ray and his friend Peter Pavia. They were equipped with a sharp blade on the end of a long stick and were snicking off flowers from plants of *Dendrobium canaliculatum* (tea tree orchid), which are abundant in this area. The idea was to see if they could find plants with unusual colour patterns in the flowers.

Ray had in the past spent a lot of time in the bush, but was starting to spend more time with his species collection, and with growing species from seed in flasks. In this he was in partnership with pharmacist Peter Pavia. I spent many hours with Ray and Barbara on the patio at the side of their house chatting about orchids, with a bit of politics thrown in. His collection of species from around the world never failed to throw up something of interest whenever I visited. He was always available to help novice growers.

Ray was a staunch member of the Australian Orchid Foundation for many years and, along with good friend Len Lawler, he was a major factor in getting northern orchid identities recognised with an AOF Award of Honour. Among those he proposed were: Len Lawler, Alick Dockrill, Bruce Gray, Jack Wilkie, Ken McPherson and myself. Ray was president of the Townsville Orchid Society for many years. Along with a few others he was involved in the far-seeing purchase of the society's own building – the envy of most other orchid societies. This hall allowed freedom in staging shows and in holding meetings, and was also a source of revenue.

Rather quiet and retiring in nature (except when riled), Ray was a good organiser, but often preferred to remain in the background. An example of this is what is probably Ray's greatest achievement – the publication of the *Proceedings of the 8th Australian Orchid Conference*, held in Townsville in 1983. Ray was part of an enthusiastic committee which put on a conference and show the equal of that produced by any capital city. His major contribution was to organise a list of guest lecturers and then to publish the proceedings

Ray's list of expert guest speaker of world standing included Philip Cribb, Professor Rapee Sagarik, Stephen Hopper, Len Lawler, Emerson 'Doc' Charles, Rev. Cannon Crutwell, Alick Dockrill, Frank E. Shride, David Jones, Bruce Gray and several others. The resulting volume of the proceedings, edited by Ray, was a world class publication and greatly enhanced by numerous line drawings by noted orchid artist Mair Swann. Well known orchid academic Professor Joseph Arditti commented 'altogether the package is superb and I would strongly recommend it'.

Ray passed away on 15 November 2016 in Townsville. He was a great orchid grower and an even greater friend, and is greatly missed.

#307 *Dendrobium bigibbum* 'Venus' HCC/ANOS 2018 (NSW)

Points	81.3
Owner	DUNO & Elermore Orch.
Date & event	12 April 2018 -
Photos by	Ian Chalmers
#flowers/inflorescences	18 / 2
Measurements(mm): flower petal sepal dorsal labellum inflorescence length	 63.4 across 55.7 vertical 37L 30W 35.4L 18.7W 27.9L 16.8W 29.5L 16.4W 400
Detailed avge points: shape(25) colour(20) size(15) substance/texture(10) floriferousness(15) habit/attractive(15)	 19.7 17 13 7.6 12 12

#308 *Dendrobium affine* 'Margaret' HCC/ANOS 2018 (NSW)

Points	79.2
Owner	Fred Fear
Date & event	21 April 2018 -
Photos by	Phil Radford
#flowers/inflorescences	29 & 10 buds / 4
Measurements(mm): flower petal sepal dorsal labellum inflorescence length	 68 across 55vertical 36L 23W 11L 33W 22L 11W 28.6L 9.5W 450
Detailed avge points: shape(25) colour(20) size(15) substance/texture(10) floriferousness(15) habit/attractive(15)	 20.2 17.3 13.4 7.4 10.4 10.5

#309 *Dendrobium tetragonum* subsp. *cataractarum* 'Seija' ACC/ANOS 2018 (QLD

Points	79.6
Owner	Angelina Rowell
Date & event	5 August 2018 -
Photos by	Angelina Rowell
#flowers/inflorescences	275 & 8 buds / 60
Measurements(mm): flower petal sepal dorsal labellum inflorescence length	 33 across 62 vertical 25L 1.5W 45L 4W 40L 4W 10L 8.5W 29
Detailed avge points: shape(25) colour(20) size(15) substance/texture(10) floriferousness(15) habit/attractive(15)	

#310 *Dendrobium* Australian Freckles 'Emily' HCC/ANOS 2018 (QLD)

Points	75.9
Owner	Leonard & Karen Kinnish
Date & event	18 August 2018 -
Photos by	Graham Corbin
#flowers/inflorescences	36 & 2 buds / 15
Measurements(mm):	
flower	30 across 28 vertical
petal	20L 5W
sepal	25L 5W
dorsal	20L 5W
labellum	16L 7W
inflorescence length	30
Detailed avge points:	
shape(25)	
colour(20)	
size(15)	
substance/texture(10)	
floriferousness(15)	
habit/attractive(15)	

#311 *Dendrobium speciosum* 'Lorraine Burnham' HCC/ANOS 2018 (QLD)

Points	77.3
Owner	Tony Trigger
Date & event	23 August 2018 -
Photos by	Graham Corbin
#flowers/inflorescences	445 / 6
Measurements(mm):	
flower	40 across 50 vertical
petal	24L 3.5W
sepal	23L 6W
dorsal	29L 6.5W
labellum	13L 4W
inflorescence length	420
Detailed avge points:	
shape(25)	19.4
colour(20)	15.6
size(15)	11
substance/texture(10)	7.6
floriferousness(15)	11.5
habit/attractive(15)	12.2

#312 *Dendrobium* Dingadee 'Alex' HCC/ANOS 2018 (Combined panel)

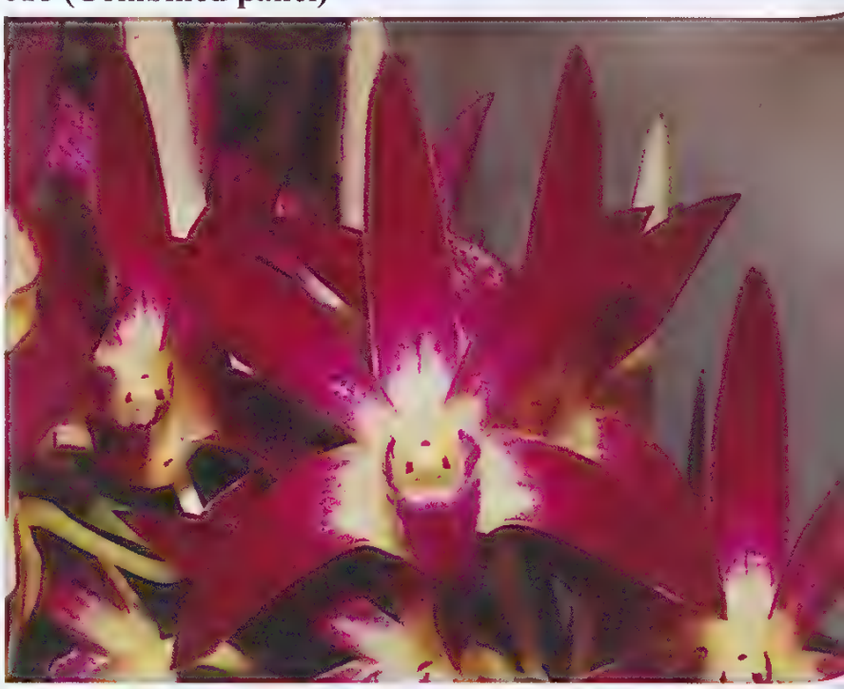
Points	78.8
Owner	Wayne Perrin
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	44 / 3
Measurements(mm):	
flower	40 across 61 vertical
petal	28L 5.5W
sepal	29L 12W
dorsal	35L 9W
labellum	20L 8W
inflorescence length	190
Detailed avge points:	
shape(25)	20
colour(20)	16.1
size(15)	11.5
substance/texture(10)	8.1
floriferousness(15)	11.6
habit/attractive(15)	11.5

#313 *Dendrobium* Dingadee 'Matt' AM/ANOS 2018 (Combined panel)

Points	80.3
Owner	Wayne Perrin
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	46 / 3
Measurements(mm):	
flower	54 across 60 vertical
petal	30L 8W
sepal	28L 14W
dorsal	39L 11W
labellum	17L 9W
inflorescence length	220
Detailed avge points:	
shape(25)	20.3
colour(20)	16.2
size(15)	12.2
substance/texture(10)	8.2
floriferousness(15)	11.5
habit/attractive(15)	11.9

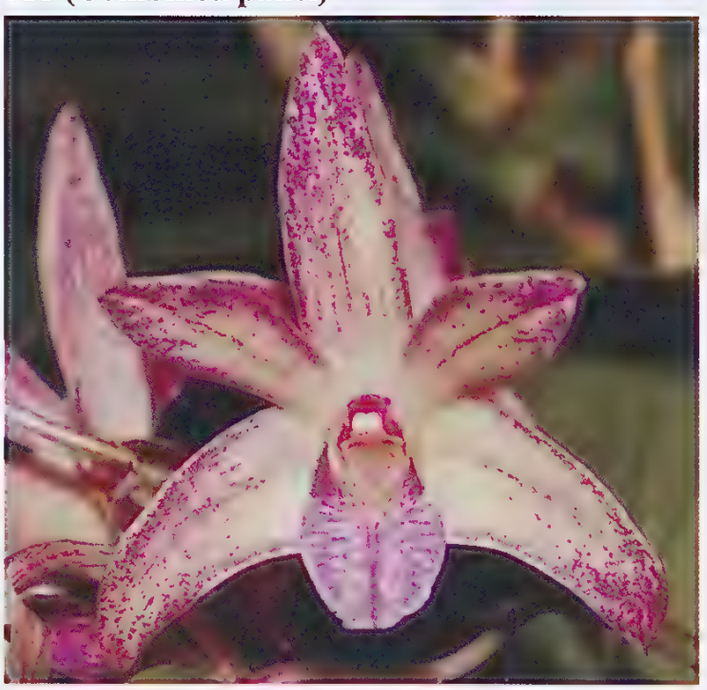
#314 *Dendrobium* Jayden 'Sheen' AM/ANOS 2018 (Combined panel)

Points	83.6
Owner	Henk van den Berg
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	207 & 79 buds / 23
Measurements(mm):	
flower	46 across 80 vertical
petal	40L 9W
sepal	41L 9W
dorsal	51L 8W
labellum	24L 9W
inflorescence length	400
Detailed avge points:	
shape(25)	21.1
colour(20)	17.1
size(15)	12.5
substance/texture(10)	8.2
floriferousness(15)	12.4
habit/attractive(15)	12.3



#315 *Dendrobium* Skilly's Pride 'WAP' AM/ANOS 2018 (Combined panel)

Points	81.7
Owner	Wayne Perrin
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	123 & 1 bud / 15
Measurements(mm):	
flower	47 across 55 vertical
petal	30L 10W
sepal	26L 11W
dorsal	34L 10W
labellum	20L 11W
inflorescence length	200
Detailed avge points:	
shape(25)	20.9
colour(20)	16.5
size(15)	12.3
substance/texture(10)	8.0
floriferousness(15)	11.9
habit/attractive(15)	12.1



#316 *Dendrobium speciosum* 'Evelyn' HCC/ANOS 2018 (Combined panel)

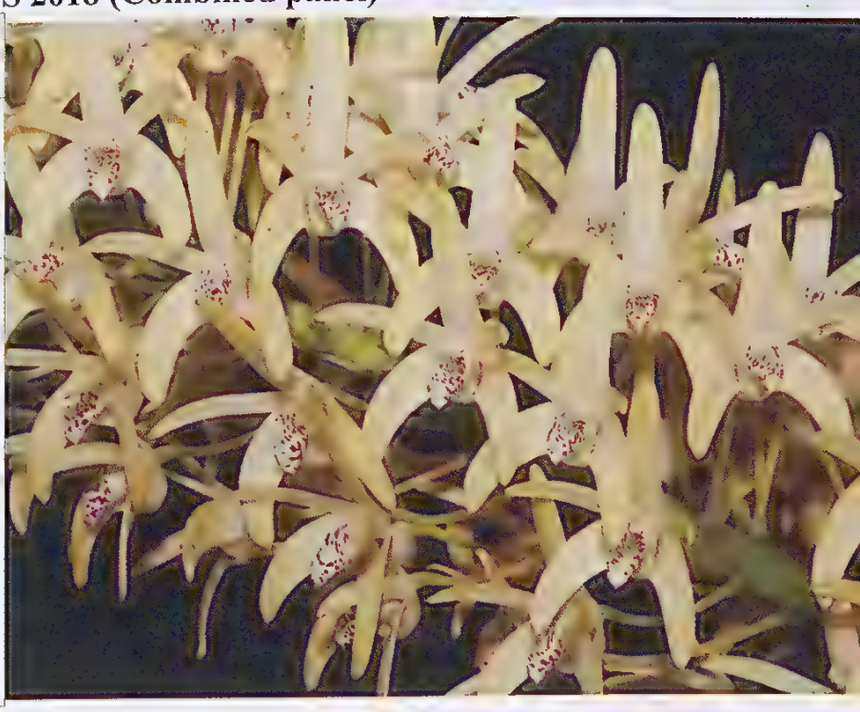
Points	79.6
Owner	Bernie Fletcher
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	397 / 5
Measurements(mm):	
flower	38 across 50 vertical
petal	29L 4W
sepal	30L 6W
dorsal	32L 6.5W
labellum	15L 6W
inflorescence length	600
Detailed avge points:	
shape(25)	20.1
colour(20)	16.1
size(15)	11.8
substance/texture(10)	7.8
floriferousness(15)	11.9
habit/attractive(15)	11.9

#317 *Dendrobium speciosum* var. *curvicaule* 'Sundowner' HCC/ANOS 2018 (Combined panel)

Points	76.8
Owner	Bernie Fletcher
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	228 / 3
Measurements(mm):	
flower	23 across 41 vertical
petal	27L 5W
sepal	28L 7W
dorsal	29L 6W
labellum	16L 5W
inflorescence length	420
Detailed avge points:	
shape(25)	19.7
colour(20)	16.3
size(15)	11.4
substance/texture(10)	7.6
floriferousness(15)	10.4
habit/attractive(15)	11.4

#318 *Dendrobium speciosum* 'Tiki' HCC/ANOS 2018 (Combined panel)

Points	77.4
Owner	Ted & Winsome Walmsley
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	332 / 4
Measurements(mm):	
flower	23 across 43 vertical
petal	23L 3W
sepal	25.5L 7W
dorsal	24L 6W
labellum	12L 5W
inflorescence length	540
Detailed avge points:	
shape(25)	19.9
colour(20)	16.0
size(15)	11.0
substance/texture(10)	7.6
floriferousness(15)	10.9
habit/attractive(15)	12



#319 *Dendrobium* Australian Freckles 'Best Blue' ACC/ANOS 2018 (Combined panel)

Points	81.5
Owner	Down Under Native O.
Date & event	2 September 2018 Kempsey Speciosum S.
Photos by	John Klepetko
#flowers/inflorescences	600 / 200
Measurements(mm): flower petal sepal dorsal labellum inflorescence length	 7.7 across 7.7 vertical 3.7L 1.9W 4.8L 2W 4.8L 3W 6.4L 4.8W 35
Detailed avge points: shape(25) colour(20) size(15) substance/texture(10) floriferousness(15) habit/attractive(15)	

#320 *Dendrobium tetragonum* var. *tetragonum* 'Jess' ACC/ANOS 2018 (Combined panel)

Points	81.8
Owner	Bernie Fletcher
Date & event	2 September 2018 Kempsey Speciosum S,
Photos by	John Klepetko
#flowers/inflorescences	116 & 2 buds / 37
Measurements(mm): flower petal sepal dorsal labellum inflorescence length	 35
Detailed avge points: shape(25) colour(20) size(15) substance/texture(10) floriferousness(15) habit/attractive(15)	

#321 *Dendrobium* Grey Ghost 'Tumbi' ACC/ANOS 2018 (NSW)

Points	84.3
Owner	Lorraine & Bill Dobson
Date & event	7 September 2018 -
Photos by	Bill Dobson
#flowers/inflorescences	570 & 5 buds / 114
Measurements(mm): flower petal sepal dorsal labellum inflorescence length	 38 across 25 vertical 19L 3W 18L 4W 20L 4.5W 10L 15W 60
Detailed avge points: shape(25) colour(20) size(15) substance/texture(10) floriferousness(15) habit/attractive(15)	

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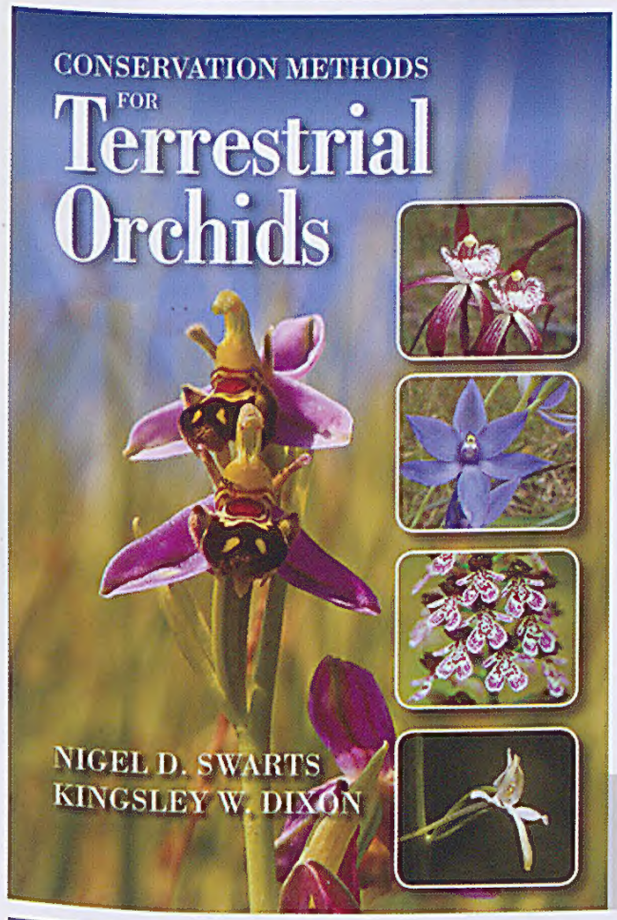

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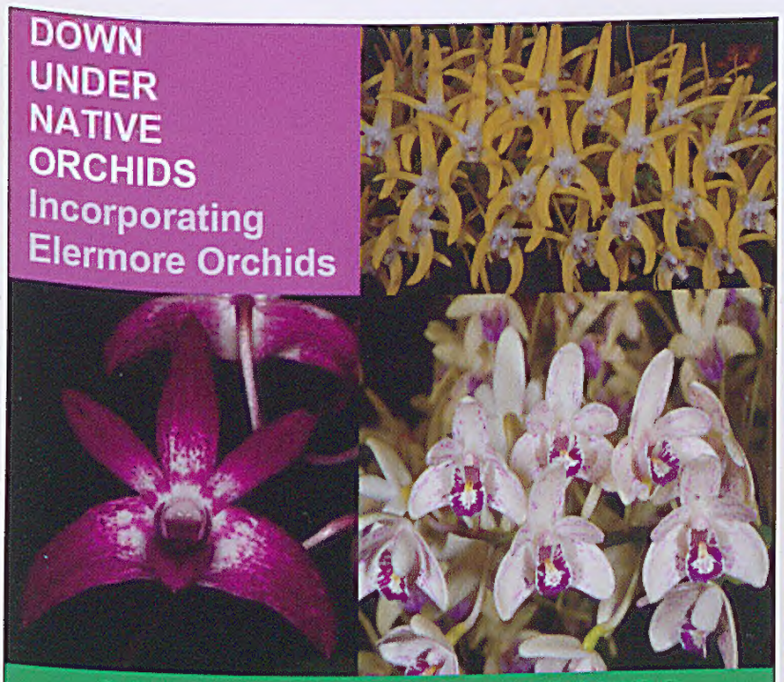

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- **ANOS Central Coast**; PO Box 3010, Erina NSW 2250 - Neville Lee (02)4340 5157 2nd Wednesday each month, 8pm. Narara Community Centre, 2 Pandala Rd, Narara 2250
- **ANOS Far North Coast Inc.**: 2 Treelands Cres, Ballina, NSW 2478 - Keith Skaines (02)6686 6303 3rd Saturday of month (except Dec. & Jan.), 2pm various venues, contact the secretary.
- **ANOS Illawarra**: 2 Wilford St, Corrimal NSW 2518 - Bruce Porter (02)4284 8308 2nd Tuesday each month, 7pm. Old Court House, Wollongong.
- **ANOS Macarthur and District**: 7 Pickett Ave, Minto NSW 2566 NSW - Wally Southwell (02) 4681 8589 3rd Thursday each month, 8pm. Birriwa Community Hall, Fitzpatrick Rd, Mt Annan.
- **ANOS Mid-North Coast**: 69 The Lakes Way, Forster NSW 2428 - John Zietsch (02)6554 9733 3rd Sunday each month, 12 noon, followed by BBQ. Contact for location - Taree or Wauchope
- **ANOS Newcastle Inc.**: PO Box 5079 Raymond Terrace NSW 2324 - Peter Denning (02)4975 3729 4th Thursday of month, 7.30pm. Elermore Vale Community Centre, Croudace St, Elermore Vale.
- **ANOS Sydney Inc.**: 9 Alicia St, Glenwood NSW 2768 - Andrew Locke (02)8824 6338 3rd Friday each month, 8pm. Senior Citizens Hall, B.H. Community Centre, Conie Ave, Baulkham Hills.
- **ANOS Warringah Inc.**: PO Box 421, Forestville NSW 2087 - Bill Dobson (02)9981 2525 3rd Tuesday each month, 8pm. Community Hall, Starkey St, Forestville.

QUEENSLAND

- **ANOS Beenleigh Inc.**: PO Box 1130, Beenleigh QLD 4207 - David Cleal (07)3805 6865 1st Thursday each month, 7.30pm. Showground Hall, James St, Beenleigh
- **ANOS Kabi Inc.**: PO Box 424, Aspley QLD 4034 - David James (07) 3359 5752 2nd Tuesday of month except Jan., 7.30pm. Isabella Griffin Room, Strathpine Community Centre, 199 Gympie Road, Strathpine.
- **ANOS Mackay and District**: 24 Barton St, Mackay, QLD - Arthur Pinkney (07)4952 2186 2nd Thursday each month, Andergrove Community Centre, Celeber Drive, Andergrove.
- **ANOS Townsville Inc.**: 92 Curie St, Wulguru QLD 4811 - John Nuss (07)4778 4311 1st Tuesday monthly (excl. Jan.) 8pm Townsville O.S. Hall, Joe Kirwan Pk, cnr Bamford Lane & Charles St, Townsville
- **Native Orchid Society of Toowoomba Inc.** 106 Umbiram Rd, Wyreema QLD 4352 - Josie Wright (07)4696 2150 1st Friday of month, 7.30pm Lutheran Church Hall, cnr West and Alderley St, Toowoomba

SOUTH AUSTRALIA

- **Native Orchid Society of South Australia Inc.**: PO Box 565 Unley SA 5061 - Les Nesbitt (08) 8261 1550 4th Tuesday each month, 8pm. St Matthew's Hall, 67 Bridge St, Kensington.

VICTORIA

- **ANOS Geelong Inc.**: 609 South Street, Ballarat VIC 3350 - Anita Hinton (03) 9743 6040 2nd Wednesday each month, 7.30pm. Uniting Church Hall, Yarra St, Geelong.
- **ANOS Melbourne Suburbs Inc.**: PO Box 169, Bayswater VIC 3153 - Richard Johnson 04 7808 7752 4th Wednesday of month (excl. December & January), 7.30pm. Montrose Primary School, Leith Rd, Montrose 3765
- **ANOS Victoria Inc.**: PO Box 308, Boronia VIC 3155 - (03)9387 2771 1st Friday each month, 8pm. Toorak Uniting Church Hall, , 603 Toorak Rd, Toorak.

WESTERN AUSTRALIA

- **ANOS Western Australia Inc.**: Mrs Lyn Morgan, 99 Bywater Way, Wilson WA 6107 - (08)9451 2164 2nd Monday each month, 8pm. Wilson Community Hall, Braibrise Rd, Wilson.

NEW ZEALAND

- **ANOS New Zealand Native Orchid Group** 42 Titiro Moanna Rd, Korokoro, Lower Hutt 5012

Sarcochilus falcatus 'Judy' ACC/ANOS 2018
Owner: John Douglas. Photo Bill Dobson